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MEDICAL AND CHIRURGICAL FACULTY
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Baltimore Ear, Nose and Throat Hospital
Part I

Maryland

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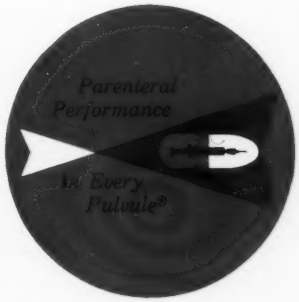

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Table of Contents on page V

IN EPILEPSY... PREREQUISITE FOR PARTICIPATION: THERAPY

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REQUISITE FOR THERAPY: THE PARKE-DAVIS FAMILY OF ANTICONVULSANTS

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VOLUME 8 *October, 1959* NUMBER 10

EDITORIAL

THE AMERICAN MEDICAL EDUCATION FOUNDATION

WILLIAM S. STONE, M.D.*

In Maryland the annual campaign for physicians' contributions to the American Medical Education Foundation is conducted in the fall. There are no funds specifically allocated for this campaign, and no formal appeals to Maryland physicians, other than this editorial and one mailing from the Medical and Chirurgical Faculty, are possible.

In the past contributions by physicians to AMEF have been matched by the American Medical Association or philanthropic agencies. The total of the original contribution plus matching funds available are forwarded annually to the medical schools designated by the donor. If the donor has not designated a school, such funds are divided equally among all medical schools in the United States. Last year the total contribution to all medical schools by American Medical Education Foundation was $1,133,653.58.

These gifts play a vital role in the operation and development of every medical school. Their use is unrestricted except for use in capital improvements. Many times these funds are used to supplement budget items that are inadequate. Most schools have had occasions when they have been able to attract and retain key faculty members by using American Medical Education Foundation funds to meet salary costs not planned in the budget. New equipment has been purchased when it was urgently needed. American Medical Education Foundation funds have made it possible for faculty members to participate in many scientific meetings, for which other funds were not available. Through use of American Medical Education Foundation funds, many faculty members have taken special courses of instruction to enhance their teaching ability.

Progress means change; changes in faculty and equipment requirements are costly. American Medical Education Foundation contributions are playing a substantial role in making progress possible.

The number of Maryland physicians contributing to American Medical Education Foundation has increased steadily during the past five years. Some states, such as Illinois and California, have found it desirable to add a $10.00 to $20.00 contribution to American Medical Education Foundation as part of the dues to the state medical society. We in Maryland have felt that support for medical education by physicians would be forthcoming without any compulsory aspect to the contribution.

All physicians are dedicated to improving the health of their patients and the public. This is only possible by maintaining the quality of medical education. Our medical schools need help and contributions from all physicians. We are hopeful that all physicians in Maryland will find it possible to meet their obligation toward medical education.

* Chairman, Committee to Cooperate with the American Medical Education Foundation.

Baltimore Eye, Ear and Throat Hospital

Part I*

HISTORICAL SKETCH OF THE BALTIMORE EYE, EAR AND THROAT CHARITY HOSPITAL

LOUIS DIENER, M.D.

The Baltimore Eye, Ear and Throat Charity Hospital, organized in 1882, was the result of consolidation of the efforts of a number of physicians who had been operating private dispensaries throughout the city. Dr. Russell Murdock and Dr. Samuel Theobald were the moving spirits in the formation of the new hospital. They were ably assisted by Doctors Frank, McKenzie, Hartman, Johnson and others.

The original building, actually a free dispensary with a small hospital attached, was located at 186 West Franklin Street. Here the poor and needy of Baltimore received eye, ear and throat treatment and counsel from specialists who were recognized throughout the country as leaders in their profession. Eventually patients who could and did pay for professional services began to come, too.

In 1895, when the hospital outgrew its facilities, a movement was inaugurated to erect a new and larger building. Money for this purpose was contributed by generous friends of the hospital, and a new structure was erected on the site of the old one. The building was completed and occupied in 1898. It provided for one operating room, a dressing room, larger clinical rooms, 12 private patient rooms, 16 ward beds, and quarters for nurses.

At this time Dr. Harry Friedenwald was elected a member of the Board of Managers. He gave so much time and effort to this institution that it was affectionately referred to as the Friedenwald Hospital. Even today some people call it the Friedenwald Hospital.

The year 1907 marked the twenty-fifth anniversary of the hospital. The work of the hospital had continuously increased, and the size of the medical staff had also increased. Bed capacity increased from 32 beds in 1898 to 47 beds in 1907.

In 1917 the ladies auxiliary was organized, which to this day has been of great assistance to the hospital.

The Baltimore Eye, Ear and Throat Charity Hospital continued to grow by leaps and bounds, while the location became less desirable. In 1922 the property on the southwest corner of Eutaw Place and Lanvale Street was purchased. A new wing was added and other alterations made. The new hospital contained four wards of eight beds each: for white men, white women, colored men and colored women. It had a capacity for 60 beds. The surgical suite consisted of an operating room for eye work, two operating rooms for ear, nose and throat work, a sterilizing room, a dressing and supply room, a doctor's dressing and locker room and an examining room.

In 1925 the property on the southeast corner of Madison Avenue and Lanvale Street was purchased for the addition of an outpatient department. The establishment of such a department had a twofold purpose: to attract suitable house officers, and to afford junior members of the hospital staff clinical and operative work. A permit was obtained from the Baltimore City Council, the building was renovated, and the outpatient department was opened in October 1926.

During the earliest years of the hospital there was one house officer. After a few years the number was increased to two: one on the ophthalmological

* The articles in Part I of the Baltimore Eye, Ear and Throat Hospital issue relate to diseases of the ear, nose and throat. Ophthalmological problems will be covered in Part II of the Baltimore Eye, Ear and Throat Hospital issue, scheduled for November 1959.

Editors Note: We acknowledge the efforts of Jerome Snyder, M.D. in assembling and editing the ear, nose and throat papers presented in this issue of the Journal.

service and the other on the otolaryngological service. In 1949 the term of service in the hospital by the house officers was increased to three years, in compliance with the requirements of the American College of Surgeons and the American Specialty Boards. Because of the increased work carried on at the hospital, it became necessary to increase the number of house officers to six—three on eye, and three on ear, nose and throat.

An antiluetic clinic was established in 1910. This clinic has continued, but its work has decreased recently, due to the establishment of city clinics. A well-equipped clinical laboratory was established in 1927, under the direction of a qualified pathologist and a fulltime technician. An allergy clinic was formed in 1947 and a bronchoscopic department in 1948, at which time modern x-ray facilities were also installed.

The Baltimore Eye, Ear and Throat Charity Hospital represents 76 years of constant growth in its effort to answer the needs of the community. Today it has ten private rooms, 27 semiprivate beds and 31 ward beds. The average census is approximately 23,000 outpatient visits and 4,500 hospital admissions per year. Once again our present facilities are overtaxed, and plans are being made for a new, modern and enlarged hospital.

Medical students from the University of Maryland attend regular sessions at the Baltimore Eye, Ear and Throat Hospital for instruction in ophthalmology. The house staff is composed of three residents in ophthalmology and three in otolaryngology. A comprehensive training program is provided in each of these specialties. The hospital requires and subsidizes special postgraduate courses for the residents at medical centers in other cities. These courses amplify the abundant clinical case material that is utilized. This intensive program is the reason for the long standing accreditation and recognition by the American College of Surgeons and the respective specialty boards.

2449 Eutaw Place
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FIRST NATIONAL CONFERENCE ON MEDICAL ASPECTS OF SPORTS INJURIES TO BE HELD IN DALLAS

The first national Conference on the Medical Aspects of Sports, sponsored by the American Medical Association, will be held November 30 in Dallas, Texas.

The one-day meeting is for college and high school athletic directors, coaches, trainers, and doctors. "These are the individuals who are charged with responsibility for the health of athletes," said Dr. Allan J. Ryan, Meriden, Conn., chairman of the A.M.A. Committee on the Medical Aspects of Sports.

The conference will deal with a wide variety of medical subjects which affect the athlete's total well being. These include training, conditioning, prevention and treatment of injuries, and the physiology of exercise. Highlights of the program will be panel discussions of on-field responsibilities of the team physician and prevention of head injuries in athletics. Other discussions will concern amphetamines and the attitudes of athletes; a medical program for high school football; exercise and the oxygen debt; the biodynamic potential of the American male; exercise and the kidney, and the pathology of trauma.

The national Conference on the Medical Aspects of Sports will precede the clinical meeting of the A.M.A., which begins December 1 in Dallas and continues for four days.

Scientific Papers

OSTEOMA OF THE PARANASAL SINUSES

JEROME SNYDER, M.D.

Osteomata in the paranasal sinuses are seen more frequently than was formerly thought, although less commonly than malignant tumors of the sinuses. They are usually noted as incidental findings on routine sinus x-rays and exhibit great variability in size.

In order to check the incidence of this condition at the Baltimore Eye, Ear and Throat Hospital, the diagnosis of osteoma as found on sinus x-rays was reviewed. Osteoma was reported in 11 cases out of a total of 1,777 consecutive routine sinus x-rays for an incidence of .61 per cent. In all cases the tumors were found in the frontal sinuses.

In 1939 Childrey noted osteoma in 15 cases of 3,510 sinus x-rays for an incidence of .43 per cent. Twelve of the osteomata were in the sinuses, and three were growing directly from the frontal bone outside of the sinuses.

Osteomata occur most commonly in the frontal sinuses, occasionally in the ethmoids, and rarely in the maxillary sinuses. Begley and Halberg from 1930 to 1950 found osteomata in 51 patients. There were 36 males and 15 females, ranging in age from 10 to 79. They reported what seems to be a high incidence of surgical removal, operating on 29 cases and keeping 22 under observation. In the 51 patients, the frontal sinus was involved in 40, the ethmoids in nine, and the maxillary sinus in two; none were found in the sphenoids. They stated that there were no "silent osteomas" in the group of lesions found in the ethmoid sinuses. Because of the limited space in the ethmoid region, symptoms occurred earlier there than in the frontal sinuses.

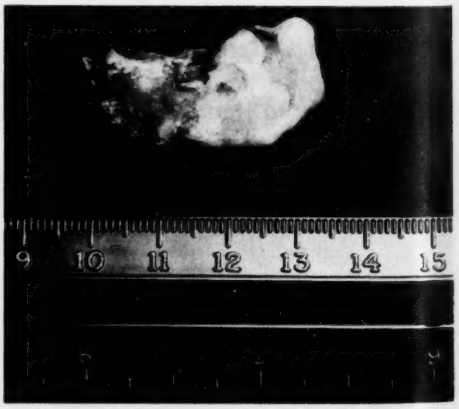
Trauma has been considered of etiological significance by some (Andrew 1936), but the majority of authors doubt a traumatic origin.

It has also been hypothesized that slightly virulent infection in the sinuses might give rise to proliferation of osteoblasts and subsequent tumor formation. The probability, however, is that the tumor is primary and the infection of the sinuses is due, secondarily, to occlusion of the sinus openings.

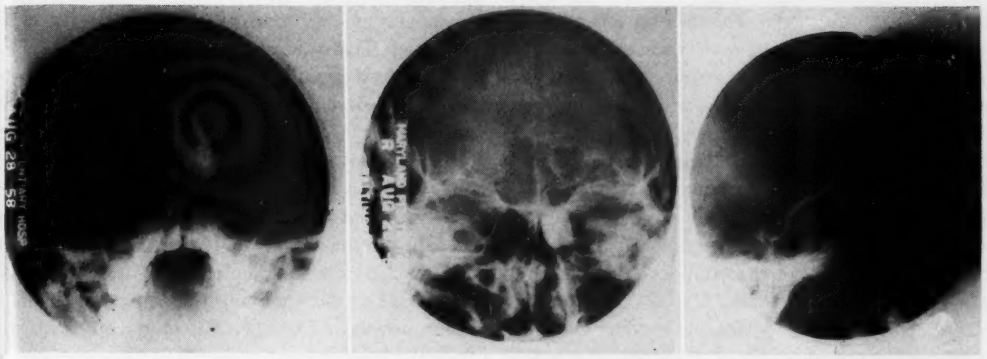
For the most part the osteoma is an incidental finding on routine sinus x-rays, and the diagnosis is made entirely by x-ray. It is often attached to the sinus wall by a bony pedicle, and the site of attachment is quite variable. In the later stage the pedicle might be fractured or obliterated. A layer of mucoperiostium covers the tumor, which is continuous with the lining of the sinus. In advanced cases the mucous membrane is destroyed, and the tumor is covered only with a thin layer of fibrous tissue.

The size of the osteoma can vary from pea size to a larger, space occupying lesion, that can completely fill the sinus and extend beyond its confines, creating symptoms of pressure and displacement of the neighboring structures. When this latter situation exists these tumors become symptomatic and require surgical removal. Patients presenting this condition have been treated by neurosurgeons, ophthalmologists and rhinologists, depending on whether the presenting symptoms were intracranial, orbital or nasal.

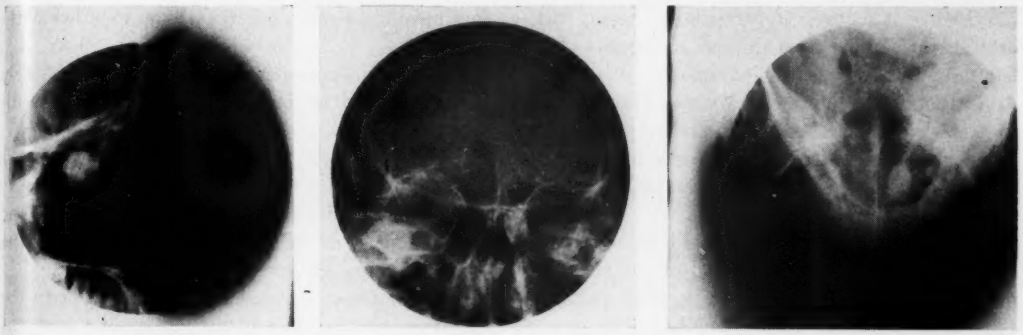
Symptoms can be pain, which can be unilateral or in relation to the eye; or frontal headaches can



Specimen consists of a generally elliptical but somewhat irregularly shaped fragment of bone measuring 3.5 cm. in length and 1.5 cm. in thickness. The surface of this bony structure is generally smooth except at one end, where it is slightly roughened at what appears to be the point of attachment.



X-rays taken in August 1958 at the time the patient presented himself for treatment



X-rays taken 2½ yrs prior to operation, following a head injury in an automobile accident. Osteoma is considerably smaller than when seen in 1958.

exist with no lateralizing features. Pain can be produced by encroachment on and blockage of the sinus ostea or pressure on the anterior or posterior ethmoid or sphenopalatine nerves. The patient may be entirely free from headache until the tumor erodes into the cranial fossa.

Deformity is a common symptom and depends upon the location of the tumor.

Visual disturbances can occur by displacement of the eye and limitation of motion of the eye. Bilateral optic atrophy leading to total blindness from a sphenoidal osteoma was reported by Harrison in 1942.

Infection of the sinuses can result from blockage of the ostea. Intracranial spread of the infection is the most serious complication of the tumors. Andrew, a neurosurgeon, in his series of five osteomata, reported one case of meningitis and one brain abscess.

A frontal osteoma can erode into the scalp, dura, or orbit; an ethmoid osteoma can erode into the anterior cranial fossa or into the orbit.

Report of Case of Ethmoidal Osteoma

B. F., a 17 year old white male who was an inmate of a penal institution in Hagerstown, Md., was seen in August of 1958. He complained of headaches of two years' duration. They were located in the frontal region and were not lateralized. The headaches were becoming more frequent and more severe in the preceding two months and were not associated with ophthalmologic, rhinologic or other complaints. A routine sinus x-ray showed a bony tumor in the left ethmoidal region, and the patient was transferred to the Maryland State Penitentiary Hospital for definitive treatment.

It was presumed that this osteoma, because of its location and size, could readily produce the headaches of which the patient complained. Intranasal examination was completely normal, the left middle meatal region showing no evidence of deformity or any other abnormality.

Two years previously the patient was involved in an automobile accident and sustained a head injury. He was taken at that time to Baltimore City

Hospitals, where x-rays showed no evidence of fracture. These earlier x-rays were obtained for comparison and showed the presence of the osteoma, but there was a moderate difference in size, showing that the present ethmoid osteoma was indeed proliferating and had sustained an appreciable increase in size during the intervening two years. Because of this and the vulnerable location of the growth, surgical extirpation was decided upon. A transantral approach to this ethmoidal tumor was considered most feasible.

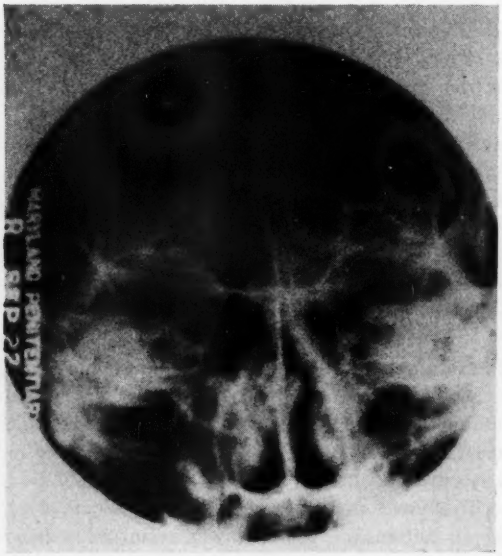
The operation was performed under local anesthesia, after preoperative sedation with Nembutal® and Demerol®. Xylocaine® was injected into the inferiororbital fissure, pterygopalatine fossa, infraorbital nerve and buccal mucous membrane of the left side. Cocaine was applied topically in the nose. An incision in the buccal mucous membrane exposed the anterior wall of the antrum, and an opening was made in the canine fossa. A wide opening was made in the anterior wall of the antrum, extending superiorly to the medial side of the infraorbital nerve. The antral mucosa appeared normal throughout. On the postero-superior wall of the antrum a rounded bulge was observed which, when palpated, was compressible like a ping-pong ball. This area of bone was removed, and it was seen that the ethmoid cells were being pushed down into this area. The anterior ethmoid cells were removed with forceps and Lima curets until a whitish, hard, bony mass was observed. This was apparently the osteoma which was wedged tightly in place. The dissection was extended inferiorly and posteriorly through the posterior ethmoid cells, and the sphenoid sinus was entered. The osteoma could then be rocked slightly but could not be removed until separation was gently carried out laterally on the orbital side and medially on the nasal side. It then came away in toto. The operation was completed, as in the classical Caldwell-Luc, by removing the bony wall of the inferior meatus and laying a flap of mucous membrane from the inferior meatus downward into the antrum. No packing was inserted. The buccal-gingival mucous membrane was allowed to come together without sutures.

The patient's postoperative course was completely uneventful, and he has had no recurrence of headache.

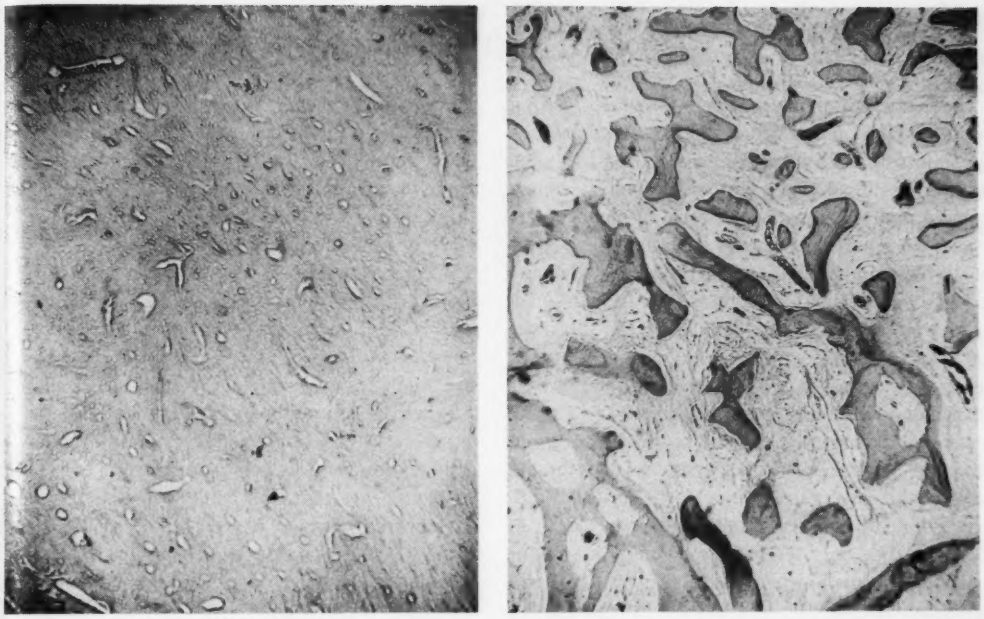
Conclusions

This report describes a case of symptomatic osteoma such as is frequently found when the ethmoid sinuses are invaded.

It was noted to be present two years prior to the operation, at the time of an automobile accident involving a head injury. If x-rays had not been taken at that time, there might have been some tendency to attribute the osteoma to that trauma.



Postoperative x-rays, September 1958



Areas of osteoma of the sinus showing on the left the dense pattern, on the right the trabeculated pattern. Two types of tissue are present. One is made up of dense bone with narrow haversian canals and only occasional osteoblastic nuclei can be found. It does have a moderately abundant vascular supply. It is typical of the dense type of osteoma. The other portion shows a loose trabeculated structure with irregular spicules of moderately dense bone, interspersed with a loose areolar connective tissue bearing numerous small blood vessels. There is no marrow formation. Some of the bony spicules show an occasional osteoblast at the surface, but there is only scant osteoclastic activity. Thus, the entire specimen represents a combination of the dense and trabeculated types of osteoma.

It is my feeling that the osteoma should have been removed at that time, since it could not be expected to remain asymptomatic for long in that location. An ethmoidal osteoma can readily erode into the orbit or brain before producing symptoms.

The transantral approach to ethmoidal osteomata provides excellent exposure with adequate working space, while allowing preservation of intranasal mucosa and structures and avoiding external skin incisions. With local anesthesia bleeding is minimal and no packing is required. Postoperative treatment in the uncomplicated case involves little more than observation.

11 East Chase Street
Baltimore 2, Maryland

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SYMPOSIUM ON EVALUATION OF EARLY DIAGNOSIS OF CANCER
AMERICAN CANCER SOCIETY SCIENTIFIC SESSION PROGRAM
Biltmore Hotel, New York
October 26–27, 1959

MENIÉRE'S DISEASE

JOSEPH I. KEMLER, M.D.

The name Meniére has been associated with a group of symptoms in which vertigo, nerve deafness and tinnitus predominate. Rainey (1) says, "No one has ever described the symptom complex so well as Meniére and with justice it bears his name." His articles were published in the Bulletin of the Academy of Medicine in Paris and in the Gazette Medicine de Paris in 1861, and were translated by McKenzie (2) and later by Atkinson (3). The latter's translation is as follows: "A girl who having journeyed by night, in winter, on the box seat of a stagecoach during the time of her catemenia became as a result of severe cold completely and suddenly deaf. She presented as the principal symptom continuous vertigo—the least effort at movement caused vomiting, and death took place on the fifth day." At autopsy, "The only lesion I could find was in the semicircular canals which were filled with a red plastic matter, a sort of a bloody exudate, a few traces of which were discovered with difficulty in the vestibule and which did not exist at all in the cochlea." Furthermore, as translated by Wells (4), "An auditory apparatus perfectly sound can suddenly become the seat of functional disturbance consisting of noises of various character, continuous or intermittent, and these are soon accompanied by more or less great diminution of hearing."

Furstenberg et al (5) characterize the disease as follows: "A violent attack of vertigo in a patient with deafness; occasionally impaired cochlear function on both sides, but more profound in the ear to which the symptoms are referred; nausea, vomiting and spontaneous nystagmus in the severe seizures; persistent tinnitus often bilateral-increased during paroxysm; vestibular tests of little significance—usually within the limits of normal; a pathetic picture of total disability in an individual suffering from a vertigenous attack, or living in the terror of an impending one." The disease may be of different degrees and severity and is no longer considered a primary one.

The case of Meniére, which was thought to be a hemorrhage in the labyrinth, has been suggested by recent observers as being a terminal stage of leukemia. Hemorrhage in the labyrinth has also been observed by others in blood disorders such as leukemia, pernicious anemia and in trauma. Otherwise, according to Ballenger (6), hemorrhage in the labyrinth has never been proved by microscopic examination. Lindsay (7) said, "The diagnosis of vascular accident in the labyrinth is more frequently made to explain the sudden onset of a severe labyrinthine disturbance in a previously healthy ear in a person of middle life or beyond."

Meniére's syndrome may occur in various neuro-otological conditions. Torok (8) states, "To mention only a few: localized or systemic diseases of the inner ear, tumors of the eighth nerve, cerebellopontine angle lesions, multiple sclerosis, and the like."

When the characteristic syndrome is experienced, either in whole or in part, without any obvious cause, Meniére's disease is surmised. Day (9) presents evidence that in Meniére's disease the cochlea is primarily affected and that the vestibular disturbance is a secondary or overflow reaction. In the first attacks vertigo is the predominant factor. These are usually quite severe and accompanied by nausea, vomiting and nystagmus, lasting from a few minutes to several hours or even days. The vertigo is of a turning nature and may be so severe that it overshadows the cochlear symptoms. However, in protracted cases, characteristic findings of Meniére's disease can be expected. After the attack the vestibular function resumes practically normal limits. Cochlear damage may be elicited. There is a reduction in hearing of a perceptive type with an involvement of the low frequencies. It is of a fluctuating nature. There may or may not be persistent tinnitus, but it is always present during the attack. The pitch is insignificant but it increases in intensity with the progress of the disease.

While the etiology of Meniére's disease is unknown, the underlying factors are gradually being recognized. Hallpike and Cairs (10) made exhaustive pathologic studies on two patients with Meniére's disease and demonstrated this condition to be a dilatation of the endolymphatic space in the labyrinth. They concluded: "In very general terms such changes correspond with those described by Wittmaak representing the reaction of the labyrinth to damage from bacterial or other toxins reaching it through the round window or via the blood stream." The dilatation of the endolymphatic space in the labyrinth has also been observed by Lindsay (11), Brunner (12) and others; hence Meniére's disease has

come to be known as hydrops labyrinthi. Some cases have been observed in which neither hydrops nor ectasia were found, but Lindsay (13) claimed: "A scrutiny of the clinical course and findings in some of these cases suggests that they may fail to meet the rigid requirements for a diagnosis of Meniére's disease." To explain in terms of the anatomical changes the most salient feature of the disease, namely paroxysmal disorder of labyrinthine function, is an interesting speculation. This has been demonstrated by Muller (14) and Parrisius (15) by microscopy, where the arterioles of the vascular loops showed a spastic state with secondary dilatation and varicosity of the adjacent vessels. Lempert, Wolff et al (16) proposed a theory that Meniére's disease is a chronic progressive herpetic neuritis of the vestibular labyrinth of toxic or trophic origin. The attack of Meniére's symptom complex is due to the rupture of one or more vesicles, with release of toxic fluid differing in chemical constitution from normal endolymph into the lumen of the endolymphatic membranous labyrinth. Guild and Lindsay (17), however, thought this a common occurrence, both in disease and health, with no effect on function. Williams (18) advanced the theory that Meniére's disease is a form of allergy with an increased transudation from the blood vessels, probably those of the stria vascularis, and that the endolymphatic distention is the result of a spastic atonic state producing a localized extracellular edema. This distention is only in the endolymph in contradistinction to a serous labyrinthitis with distention of the perilymph.

The endolymphatic hydrops in Meniére's disease is a transudation from the blood vessels and not an exudate in which the fluid is almost normal saline in character. Atkinson (19) believed it to be a constriction of the vascular supply of the labyrinthine structures. "[These] structures depend, for the integrity of their function and structure, upon end-arteries, there being no collateral circulation." He concluded, "The disturbed physiology of vasospastic changes results in primary neuronal ischemia and lymphatic hypertension." Williams (20) stated that Meniére's syndrome is characterized by cellular injury, especially to the vascular endothelium and dilated capillary loops resulting in an increased permeability of the capillary wall in the labyrinth. In other words, in Meniére's disease the capillary syndrome with protein leakage and extracellular fluid is present.

Derlacki (21) stated numerous factors must be considered as possible precipitators of the crisis of localized autonomic dysfunction of the inner ear. He also states, "The rewarding single lead was a specific antigen antibody reaction in about five–ten per cent of cases." Thus allergy, whether general or specific, is reported by some workers as a factor in producing Meniére's type syndrome. Shambaugh and Roberts (22) complained of the great difficulty experienced in securing favorable results by the routine method of skin testing and desensitization to the allergic substance. Others claimed that allergy is not an important factor in the etiology of this condition. Mellanby (39) found in experimental animals that Vitamin A deficiency caused degenerative lesions in the inner ear which might lead to vertigo and dizziness. Williams claims that in adult man Vitamin A deficiency is common; yet it has not been established definitely that it produces similar lesions.

Mygind and Dederding (23) postulated that the hypersensitive labyrinth reacts to various exogenous and endogenous influences by increased capillary permeability. These influences are rather indefinite and at times more than a little conflicting. Gundrum (24) supports allergy as an etiologic factor but lists infections and trauma as deserving some consideration. Fowler (25) stresses abnormal blood supply as the important factor in the etiology of Meniére's disease. Wright (26) states: "I believe that cases of labyrinthine vertigo which have been regarded as of unknown or doubtful etiology can all be grouped together as belonging to a single disease which I venture to call focal labyrinthitis. This disease, I suggest, is an inflammation of the labyrinth." He reported on a total of 84 cases of Meniére's disease treated by elimination of foci of infection. The results were as follows: vertigo ceased in 88 per cent; hearing improved in 70 per cent, and tinnitus was either cured or improved in 59 per cent of the cases. He attributed his low percentage of success for hearing and tinnitus to structural damage and not to a still existing progressive lesion. One would expect that to be the result in a protractive disease, as some of his cases have run a course as long as 39 years.

Since focal infection has not been completely proved by scientific methods, it has gone into disrepute. Verhoef (27) states, "Belief in focal infection must be taken like religion—on faith." Some clinics evaluate the concept of focal infection on clinical observation alone. However, miraculous cures have

been observed many times by the elimination of focal infection. The evidence for recovery on removal of foci of infection is so formidable it is difficult to dismiss lightly on the ground that it is only suggestive. Harley (28) gave two principal objections to this theory: (1) The failure to achieve good results by surgical means in the majority of cases in which a localized focus, capable of removal was found. (2) The failure to find a focus of infection at all in many cases. As regards the first objection, there may be more than one focus of infection which is overlooked or overshadowed by the more obvious one. With regard to the second objection, I have demonstrated in previous reports that there are foci of infection, as, e.g., the coated tongue which is not regarded as such by many; nevertheless, good results have been obtained by cleansing. Harley thought the failure might be due to the inability to remove the focus completely. He also said that if the mechanism of Meniére's disease is regarded as an allergic reaction to the nucleoprotein of the bacteria concerned, then it can be explained differently. In dealing with those species of organisms which commonly inhabit man, it does not follow that by the removal of one focus we have eradicated the entire infection. The organism may be found in other places which can supply the nucleoprotein idiotoxin for the same allergic reaction. Hoople (29) gave foci of infection as one of the outstanding causes of changes in blood supply and fluid balance affecting the ears. Murray and Stewart (30) have recently produced evidence on anatomical and physiological bases to support their contention that focal infection played a predominant role in Meniére's disease. They found the infection in every case observed by them. Goodyear (31) states, "Should it be a true Meniére's syndrome, focus of infection must be definitely considered."

In 1953 I reported on 29 cases of Meniére's disease, in only one of which a focus of infection was not evident. Since then 36 more cases were observed, in whom one or more foci of infection were found in the upper respiratory tract. Lederer (32) claims that the phrase "ear, nose and throat essentially negative" means nothing unless we have used all means at our disposal for examination. The laryngeal mirror to investigate the lingual tonsils, the nasopharyngoscope or a postnasal mirror for the nasopharynx, transillumination and x-ray of the sinuses. The teeth should also be thoroughly examined, not only for alveolar abscesses, but for their sensitivity and the mandible-maxilla space variation as described by Murray and Stewart (30). There still remains another possible focus of infection in the oral cavity, to which little attention has been paid, and that is the tongue—particularly the coated tongue. Gray (33) states that the tongue presents a depression, the foramen cecum from which a shallow groove, the sulcus terminalis, runs laterally and forward on either side to the margin of the tongue. The part of the dorsum of the tongue in front of this groove, forming about two-thirds of its surface, looks upward and is rough and covered with papillae; the posterior third looks backward, is smoother and contains numerous muciparous glands and a large number of lymph follicles, which together constitute what is sometimes termed the lingual tonsil. Elfman (34) claims the lingual tonsils are compensatory to faucial tonsils and are similar in structure to them. They are subject to the same affections and may act as focal infection in the same manner as the faucial tonsils do.

The papillae covering the anterior two-thirds of the tongue are minute surface eminences. They consist of a layer of connective tissue covered with epithelium. The filiform papillae are the most numerous, occupying the general area anterior to the large circumvallate papillae which form the inverted V-shaped terminal sulcus at the base of the tongue. Crohn and Drosd (40) state that each filiform papilla is surrounded by projections, the "secondary" papillae, which protrude like flexible spines or spikes covered by stratified squamous epithelium.

Henning (41) found the filiform papillae to be plump, round hillocks with transparent epithelium. Most characteristic were the secondary papillae which jutted out from the filiform papillae like blades of grass with serrations. When the tongue was coated the papillae were long, thick, firm and tense, and were surrounded by leucocytes, bacteria and particles of debris. The coating of the tongue according to Boas (42) is ideal for the development of an offensive odor of putrefaction which he calls "fetor ex lingua." This can be demonstrated by slight washing of the tongue.

Bloomfield (35) demonstrated that bacteria grow normally not only on mucous membrane but also in their superficial layers, in crevices of the superficial layers and between them, and in orifices of small glands.

Crowe's (36) statement regarding "the theoretical explanation on which is based the otolaryngological treatment and preventive measures for recurring upper respiratory infections and their complications"

can be applied to the tongue's acting as a focus of infection. Pyogenic bacteria grow on the coated tongue just as they would in a test tube. These cannot initiate infection, but when the tongue becomes infected with a virus which is an intracellular parasite, it opens a pathway of infection which may be carried through the blood stream for remote diseases.

The varied concept of the etiology of Meniére's disease is reflected in the mode of treatment. Most workers in the field are trying to relieve the patient medically. Surgery on the labyrinth is done in about ten per cent of patients and only after failure of conservative treatments. Surgery, to be effective, is the obliteration of function of the whole labyrinth. However, Lindsay (37) stated, "The use of drugs in the treatment of symptoms due to hydrops of the labyrinth would appear to be limited to a temporary effect and is of most value during the acute stage." Day (38) held that conservative treatment might be effective in controlling attacks of vertigo but will not effect a cure. Murray and Stewart (30) sum up the varied treatment for Meniére's disease as follows: "The range of therapies runs the gamut from the nonsurgical managements by diet control (Furstenberg, Lashmet, and Lathrop) and vitamin dosage (Selfridge), over the streptomycin (Hanson), nicotinic acid (Atkinson), and histamine (Derlacki, Sheldon and Horton, Shambaugh, Lillie et al.) routes, down the unmarked trails of infected foci (Wright, Kemler), through the intersection of eighth cranial nerve surgery (Crowe, McKenzie, Green and Douglass), along the byways of stellate ganglion injections or dorsal sympathectomy (Passe, Johnson, Strong) and finally, home to the complete or partial obliteration of the labyrinthine apparatus (Cawthorne, Day, Goodyear, Perlman, Portmann)." They also state that their results from elimination of foci of infection in Meniére's disease have been highly successful and extremely gratifying.

I also found that the elimination of foci of infection has resulted in permanent remissions from symptoms of vertigo, nausea and vomiting and a reduction of tinnitus, together with sometimes even partial (minimum) recovery of hearing loss. The symptoms may recur only when another focus of infection appears or becomes active as illustrated by the following case:

E. S., aged 53 years, female, married, has complained of tinnitus, vertigo and impaired hearing in the left ear for three years. Vertigo was quite severe, occurred daily and lasted more than an hour. She was forced to stay in bed during the attacks. Her hearing was poor and of the conductive type. The eustachian tubes were patent. The tongue was slightly coated with putrefactive material. The tonsils were large and infected. Cleansing of the tongue with Aureomycin® suspension improved her condition and reduced the attacks to a minimum. (We now use Achromycin® 50 mg. dissolved in 3 cc. of normal saline. This is swabbed over the coated tongue until clean and odorless. We then instruct the patient to clean the tongue in a similar manner with diluted listerine twice daily.) Five weeks later she began to have severe attacks which lasted longer and often confined her to her home for a whole week. She suffered with moderate sore throats and was advised to have her tonsils removed. Two weeks later she had a tonsillectomy. Her vertigo disappeared and has never recurred; the tinnitus became so subdued that she did not mind it; her hearing was only slightly improved. She has been observed for a period of six years and her condition remains the same.

Another case which shows the influence of focal infection on Meniére's disease is the following:

L. R., female, aged 52 years, married, was seen in October, 1935, with a severe attack of Meniére's disease. She was treated conservatively to relieve the attacks, but they recurred quite frequently until a year later, when the left antrum was found infected. This was washed out and patient was free from attacks for ten years. In 1946 she again began to have vertigenous attacks. The same antrum was found to be infected with greenish pus. This was cleaned out, and she again became free from attacks until 1953, when the left antrum again became infected. Again this was washed out, and she has had no more Meniére's attacks since. While vertigo and tinnitus have completely disappeared, her hearing has slightly reduced since the beginning of her trouble.

Another case which proves the efficacy of the focal infection in Meniére's disease is the following:

M. P., aged 70 years, female, unmarried, had nerve deafness for about 20 years. She wore a hearing aid for 15 years. Three years previously she was suddenly awakened in the middle of the night with a severe attack of vertigo of a turning nature, accompanied by tinnitus, nausea and vomiting, which lasted for about one and one-half hours. She was given a sedative and fell asleep. The following

morning she was still unsteady on her feet and the tinnitus persisted. Upon examination a moderately coated tongue covered with a characteristic putrefactive material was found. Cleansing of the tongue with Aureomycin® brought about complete recovery in about two weeks. It is interesting to note that whenever she experienced some vertigo, the tongue was found coated. The symptoms would disappear when the tongue was properly cleansed. This continued for about three months. In the past eight years she has had no further recurrences of vertigo, tinnitus or infection of the tongue. Her hearing remained the same as before the attack.

Summary

I most emphatically support the theory of focal infection in Meniére's syndrome which is not dependent upon any other malady as mentioned by other investigators. I also believe a thorough search will reveal the focus in almost every case, and that it exists mainly in the upper respiratory tract. Its eradication must be accomplished to obtain satisfactory results. Vertigo is relieved promptly and permanently, tinnitus is reduced and the hearing may improve. In the early cases these may also be abolished. These symptoms may reappear upon contracting another infection or if the original one recurs.

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RECOGNITION AND TREATMENT OF HEARING IMPAIRMENTS

ALFRED T. LIEBERMAN, M.D.

Hearing impairments impose serious consequences upon the individual so afflicted: in the child normal behavior and educational processes may be interfered with; in the adult economic security and livelihood may be jeopardized; in the older individual normal communication and relationship with friends and family may be disturbed.

Recognition of impaired hearing is for the most part not difficult, but determination of the type of hearing loss which is present and the remedial measures which may be employed is frequently attended with greater difficulty.

Hearing impairments may be divided into the following main types: 1) conduction or middle ear type of impairment, 2) perceptive or nerve type impairment, 3) a combination of the two foregoing types, so-called mixed deafness, and 4) central type of deafness.

The conductive or middle ear type of hearing impairment is associated with or follows involvement of the middle ear structures and tympanic membrane. As a result, there is interference with the transmission or conduction of sound to the cochlear end organ. Such hearing loss is characterized primarily by loss of acuity for all airborne sounds, while the ability to hear bone conducted sound remains relatively unaltered.

Perceptive or nerve type hearing impairment is due to pathologic changes in the inner ear. Such changes occur either in the organ of Corti or cochlear nerve or both. This type of hearing impairment is characterized by loss of acuity which is greater for the high tones than for low tones when tested with the audiometer or tuning forks, and by shortened or loss of ability to hear bone conducted sound.

Central type of deafness is beginning to emerge more clearly as a distinct type of deafness. The pathology in this form of hearing loss lies in the nerve pathways which carry the sound impulses to the brain from the cochlea or in the brain itself.

From a chronologic point of view it is observed that hearing impairments fall naturally into definite age groups, and it is from this aspect that the major types of hearing impairment involving each age will be considered.

Birth and Infancy

Impaired hearing, total or partial, may exist at birth, but usually it is several months or even several years before the parents become definitely aware that the child is not hearing normally. The etiologic factors responsible for the severe hearing impairment of infancy and very early childhood are quite varied. The so-called "congenital deafness" is a loosely used term which includes hearing impairments due to a variety of causes other than the congenital abnormalities. Failure of development of portions of the cochlea does occur and ranges from total absence of the end organ, with consequent total deafness, to patchy defects in the cochlear structures giving rise to "islands" of hearing.

Other causes which produce severe hearing impairment in early childhood include birth injuries, meningitis, encephalitis, rubella in the mother in the first trimester of pregnancy, mumps and measles.

Since development of speech depends largely on the ability to hear, children with severe nerve type hearing impairment also exhibit speech defects. This is largely proportional to the extent of the hearing loss. Any child, therefore, who has an obvious speech defect should be studied from the viewpoint of his hearing and mentality. Similarly, many children who are backward in school or who present behavior problems should have careful hearing studies made, since often their inability to hear adequately makes them appear to be backward or to become a behavior problem.

What is to be done for such children? Help may lie in one or several of the following lines. If the hearing that remains is within the conversational range 256 double vibrations to 3500 double vibrations, such children can derive great benefit from a hearing aid or other means of amplification. Enrollment in special schools where trained instructors can teach the children to utilize to the fullest such hearing as remains is a great help. Lip reading instruction and, more recently, the employment of visual speech methods will enable the handicapped child to receive an education and facilitate his adjustment to his surroundings.

Congenital malformation of the external ear and

auditory canal produces hearing loss of a conduction type. Such malformations are usually manifested by partial or complete atresia of the external auditory canal and frequently with malformation of the middle ear and ossicular chain.

Surgical correction of the congenital atresia of the auditory canal is often capable of improving the hearing to a serviceable level.

Childhood

This period of the individual's lifespan is subject to great hazards to the continued well-being of the hearing mechanism. Probably at no other time in life is the individual so beset by the danger of infections, many of which involve his ears and his hearing. Middle ear infections of children, associated with the ordinary upper respiratory infections as well as the acute childhood diseases, impose upon the physician a serious obligation to safeguard the child's hearing. Intelligent and proper handling of middle ear disease in children by the general practitioner as well as by the specialist can do much to circumvent chronic ear disease with its attendant hearing loss.

The discovery of sulfonamides and antibiotics has given us valuable weapons to combat infection, but we must not forget basic medical and surgical principles and come to rely too much upon these valuable adjuncts to our armamentarium of treatment. Much damage, often irreparable, can be done to patients with middle ear and mastoid disease who receive sulfa drugs or antibiotics in insufficient doses or for too short a period of time. Surgery still has its place in the treatment of ear infection, and its judicious employment may mean the difference between a chronic running ear, with all its sequelae and complications, or a complete cure.

The same precautions regarding the use of antibiotics must be observed as were employed when the sulfonamides alone were being used. Antibiotics in adequate doses together with paracentesis or adequate drainage when indicated, are by far the most effective methods of treatment of acute middle ear disease. We must not be lulled into a false sense of security regarding the efficacy of antibiotics when administered in inadequate amounts or when given alone, when the combination of drugs and surgery is indicated.

Treatment of hearing defects that occur as a result of acute infections in childhood must be directed primarily at elimination of the infection in the middle ear and secondarily toward other factors which may contribute to the continuance or recurrence of the infection. Infected tonsils and adenoids are an important factor in the production of middle ear disease. Their adequate removal involves the use of surgery as well as the employment of radium or radon to eliminate residual lymphoid tissue around the orifices of the eustachian tubes that is not accessible surgically.

In addition to the hearing defects of childhood associated with acute infectious disease, one other type of deafness is commonly encountered. It is often unassociated with any acute infectious disease; on the contrary, the onset is slow and insidious and makes itself apparent only when actual impairment of the conversational range of hearing is reached. This type of hearing impairment is a result of long-standing or frequently recurring partial occlusion of the pharyngeal end of the eustachian tube by hypertrophied lymphoid tissue. In some children, especially those with allergy, there is a great tendency for regeneration of lymphoid tissue in the nasopharynx even after a most careful surgical removal of adenoids. Frequently there is residual lymphoid tissue in and about the eustachian tube orifices which often becomes infected and causes edema and excessive activity of the mucous glands in the vicinity, and thus is responsible for impaired function of the eustachian tube. As a result of this long-standing impairment of ventilation, certain changes occur in the middle ear cavity which involve tympanic membrane, the ossicles, and often the niche of the round window. Because of these changes in the conduction mechanism for airborne sound, the clinical result is impaired hearing of varying degrees. Objectively, the patient exhibits signs of this long-standing impairment of ventilation of the middle ear. These are reflected as changes primarily in the tympanic membrane. Examination with the otoscope usually reveals retraction of the tympanic membrane, thickening and loss of the normal luster.

In many of these children the changes produced are often reversible if normal ventilation to the middle ear can be restored and maintained.

The presence of obstructing lymphoid tissue can best be determined by examination of the nasopharynx, using the electric nasopharyngoscope. Treatment of such lymphoid tissue with the radium applicator according to the technique of Crowe et al.

has proved to be a safe and effective measure of restoring normal eustachian tube function.

Adulthood

As the individual progresses from childhood to adult life, certain types of hearing impairment are found to occur. First of these is occupational type of deafness. We have recently become quite aware of this problem in young adults because of the exposure to noise that so many millions of our young men had as soldiers. Ear casualties have been heavy as a result of modern warfare. The rifle and bomb blast, the airplane engine and the submarine have all exacted a heavy toll in hearing from our soldiers, sailors and aviators.

The etiology of the hearing impairment in these young people is largely the same—exposure to noise and blast. The effect of such exposure on the mechanism of hearing is fairly well understood. The structures of the inner ear simply are not built to withstand such strain and as a result are damaged. The hearing loss that results depends upon the extent of the damage. It may vary from complete deafness to merely high tone loss.

Exactly the same type of hearing impairment is produced in many civilian occupations, where the surrounding noise level is high or where the individual is exposed to blast. The classic example is that of "boiler-maker's deafness," but many other laborers, such as riveters and machinists, are similarly affected.

There is a distinct difference in the type of hearing loss produced by blast and that produced by exposure to excessive noise. Blast produces a sharp or abrupt loss of hearing for high tones, while prolonged exposure to high levels of noise results in a "gradual" or sloping loss of hearing for high tones.

The nature of the pathology of high tone hearing loss has been carefully investigated in the work of Crowe, Guild and Polvogt, published in 1938.

Little in the way of remedial measures can be offered to this group of deafened individuals since the pathologic changes produced are irreversible. Lip reading, aural rehabilitation and hearing aids are all helpful in the adjustment of the individual to his environment. The correction of any abnormality in the nose and nasopharynx is advisable in order to safeguard the hearing that remains.

A second type of deafness found primarily in adult life is otosclerosis. In contrast to the foregoing types, the etiology of otosclerosis is not known. The disease has been recognized by otologists for many years, and many theories have been advanced regarding its cause. The essential pathology involves the conduction mechanism of the ear, specifically the ossicles. For reasons as yet unknown to us a bony ankylosis occur between the footplate of the stapes and the oval window, with a resultant fixation of the stapes and an impedance of airborne sound to the inner ear.

This form of deafness is quite common. Its onset usually occurs in young adult life; it is usually progressive, and women are more prone to be affected than men. Because the eighth nerve usually remains unaffected for a long period after the onset of the disease, certain diagnostic criteria are found in the patient suffering from this form of deafness. The usual finding is that of reduced hearing by air conduction, but with good hearing by bone conduction when tested with a tuning fork. The tympanic membranes usually look normal; the onset of hearing loss is gradual and insidious; the nasopharynx is usually normal, and as a rule both ears are affected. Audiograms are usually of a characteristic pattern—a flat loss of all tones except the higher frequencies. Tinnitus is usually present in one or both ears. At operation fixation of the stapes can usually be demonstrated.

Treatment of otosclerosis may be divided into two general headings: nonsurgical and surgical. Nonsurgical treatment of otosclerosis includes the fitting of a hearing aid and instruction in lip reading. With these measures the deafened otosclerotic is able to made a fairly good adjustment.

The surgical treatment of otosclerosis is one that has been subjected to a great deal of investigation during recent years. Although the surgical treatment of otosclerosis was tried as early as the 1890's, the revival of this form of treatment in this country is to be attributed to Dr. Julius Lempert of New York in 1938. The development of his technique of fenestration of the lateral semicircular canal for clinical otosclerosis has been responsible for a srgeu of enthusiasm by otologists everywhere. Although the great obstacle of the operation, namely prevention of the closure of the artificially created opening in the semicircular canal, has not been completely solved, continued research efforts will hasten the day when the percentage of permanently improved results will be even higher than at this time.

Surgery for otosclerosis received further tremendous impetus with the publication of the work of Rosen, in 1953, on stapes mobilization surgery. This technique, like that of fenestration surgery, was also tried and abandoned in the last century. Today, as a result of Rosen's revival of the operation, many new approaches to the problem of mobilizing the ankylosed stapes are being developed. Although the successful results of stapes surgery are not as high as those attained by fenestration surgery, the relative simplicity of the operation has made it a valuable adjunct to the fenestration technique in the surgical treatment of otosclerosis.

Another form of deafness encountered in adult life is that associated with Meniére's disease. Although the vertigo and tinnitus are much more prominent symptoms than the hearing loss that is present at the beginning, the end result of the disease is a severe deafness on the affected side.

Many theories have been formulated in an attempt to explain this disease, but it was not until 1938 that Hallpike and Cairns published their studies on the postmortem findings of the vestibular apparatus of a patient with Meniére's disease. The essential pathology was found to be dilatation of the endolymphatic system. This work has since been corroborated by others, and it is believed to represent the explanation of the clinical symptoms.

Treatment of this condition may be divided into nonsurgical and surgical measures. The commonly used nonsurgical treatment includes restriction of fluid intake, elimination of sodium chloride in the diet and ingestion of ammonium chloride. Histamine is effective in many patients—nicotinic acid, Benadryl® and other drugs sometimes stop the vertigo but rarely restore the hearing. The surgical treatment of the disease is aimed primarily at abolishing the mechanism which is producing the vertigo, or of interrupting the pathway carrying the disturbing impulses from the end organ to the brain. Destruction of the endolymphatic labyrinth by cautery, instillation of alcohol or actual evulsion have been tried. The technique developed by the late Dr. Walter Dandy, in Baltimore, was the intracranial total or subtotal section of the eighth nerve on the affected side. The advantage of this technique is that in patients with Meniére's disease who have serviceable hearing remaining, partial section of the eighth nerve, that is section of the vestibular portion alone, will permit the patient to retain his hearing yet free him from his vertigo.

Old Age

Hearing impairment associated with advancing years follows a rather characteristic pattern. The onset is insidious and the hearing impairment is slowly progressive. High tones are affected to a greater degree than are the low and middle range frequencies, and this loss produces great difficulty in "discrimination" or ability to identify words in speech. The hearing impairment is primarily a nerve type deafness, and the pathology involves the neural elements of the cochlea. Recently further studies by Bordley indicate that changes in the central nervous system of the aged contribute to their difficulty in understanding speech.

No medical or surgical remedial measures are known that can reverse this type of hearing impairment. Careful fitting of a hearing aid and much counseling to the patient and his family can do a great deal to enable the older patient to overcome his handicap.

To conclude this discussion of the problem of impaired hearing, there should be mentioned certain other diseases and pathologic states which occur at any age and produce impairment of hearing. These include acoustic tumors and other intracranial lesions, syphilis, mumps, meningitis, scarlet fever, measles and diphtheria. A careful history regarding these specific diseases should be obtained in every patient with deafness. The audiogram alone is not sufficient to make an accurate diagnosis of the type of hearing loss. Only by correlation of the audiogram with physical findings, tuning fork tests and an accurate history can we hope to arrive at an intelligent understanding of the problem of deafness.

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CERTAIN ASPECTS OF NASAL TRAUMA IN THE PRENATAL-NATAL PERIOD

ALBERT STEINER, M.D.

One of the functions of the human nose is as a protective bumper to the face. The commonest injury to mankind is said to be the blow to the cartilaginous vault of the nose. Its very prominence renders it inevitably the first line of facial defense against violence. With the supraorbital ridges it forms an effective protective buttress, shielding the more vulnerable eyes. In the adult its sturdy construction is not unlike that of an Eiffel Tower (figure 1), and the nasal bones suspended on the strong nasal spine and supported by the flying buttress-like frontal processes of the maxillae on a broad antral base achieve their full development to withstand shock. In the young child, newborn and fetus the bony elements of the external nose and septum are not so well developed. The cartilaginous elements and soft tissues predominate. If overwhelming force is applied to these structures they, too, will have a cushioning effect, but the end result will be deformity, subtle or gross, due to displacement, bending, tearing of the cartilaginous elements and localized or dissecting hematomas in various parts of the nose rather than bone fracture, although the two may be combined, and isolated fractures are not uncommon. Figure 2 shows the skull of a full term newborn with an apparently healed fracture, the nasal pyramid being displaced to the right, the base of the septum being displaced onto the floor of the left nasal fossa. Cartilaginous deviations of the septum and vault were undoubtedly associated.

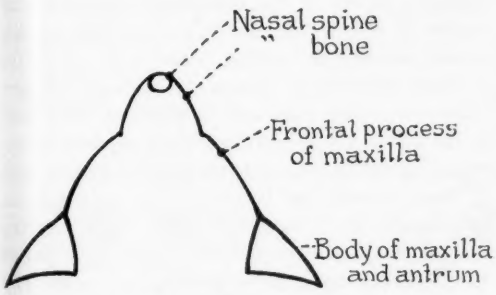


FIG. 1. The Nasal "Eiffel Tower" (after Cottle)

A fact not sufficiently recognized by obstetricians, pediatricians and many rhinologists is that nasal injury can occur before the infant sees the light of day—in the prenatal period. This may occur from the fourth month of gestation, at which time the nasal capsule is well developed, until term. To quote Schaeffer (1), "... injuries to the nose may be so remote and trivial, say during birth, or even *in utero* and in early infancy, that no marks remain, yet growth processes may have been unbalanced thereby." The evidence is circumstantial, but the fact remains that these infants are born with *healed* deformities and fractures. There may or may not be associated distortion of the nasal tip and nostrils. Kirchner (2) reported interesting observations and case reports on this problem.

FIG. 2. The skull of a newborn with a healed nasal fracture. Note asymmetry of bony pyramid and displacement of septum to left.

The term prenatal injury is not to be confused with congenital deformities and anomalies which are not within the scope of this paper. Figure 3 shows a diagram of another deformity in a new born. This

FIG. 3. A congenital deformity. Note columella inclined toward flattened side (after Cottle).

is *not* an injury but a true congenital defect, the flattening having occurred somewhere within the first two or three months of life. This was a nose which was going to develop into a harelip but didn't. The diagnostic giveaway is the inclination of the columella and septum toward the flattened side. Were it an injury this would have been in reverse.

Another and more common group of deformities of the external nasal pyramid are those which are injured during birth. Understandably, these traumatic events are more common in primiparae than in multiparae. The usual deformity is flattening. This flattening is due to compression against the sacral prominence, under the symphysis pubis or in any other part of the birth canal, such as the floor of the perineum. Another deformity is the lateral displacement of the nose usually associated with contralateral displacement of the base of the septum. More complicated structural changes may exist where a nasal birth injury is superimposed on a nose with arrested or altered fetal development.

In a study of more than 700 births in white children, the incidence of gross lateral displacement of well constructed noses was about 6 per cent. The incidence of simple flattening, depending upon how long after birth the observation was made, ranges from 30 per cent to 60 per cent. In a group of Mexican newborns the incidence of derangement was considerably less, and in a group of Negro children less still.

Out of medical curiosity, a random spot-check of the noses of newborn infants was made in the nursery of one of the local general hospitals.* They were studied with the aid of a camera and a medical illustrator. Out of a total 24 bassinets, three babies or 12.5 per cent, showed gross changes with lateral displacement. Four, or 16.5 per cent, showed evidence of flattening. Subsequent measurements and observations were made on these noses while the infants were still in the nursery to substantiate evidence of true flattening, that is a displacement of the nose backward. The flattened noses all assumed higher dimensions later. The relatively low incidence of flattening was apparently due to the fact that most of these newborns were seen some hours after birth. It is of interest to note that one of the newborns with lateral displacement had so much nasal obstruction at birth that an oral airway was required. This was removed within 48 hours, and the nose was spontaneously restored to normal within 72 hours.

In the overall consideration of obvious nasal deformities seen at birth, a certain small percentage will not correct themselves. It is here that the otolaryngologist must exercise great clinical acumen and judgment and carry out such remedial measures as he may deem necessary. The accompanying illustrations (figures 4 and 5) depict graphically the noses in the study. Base views are used because it is from this view that one can best see how the normal structures are deformed. Studying enlarged photographs, preferably in color, of this area is one of the best aids in arriving at a diagnosis (11). The superimposed phantom lines depict the eventual restored positions in those noses which were considered flattened or deflected.

This ability of an infant's nose to restore itself to normalcy is one of the remarkable phenomena of nature. It is true that the infant's septum consists almost entirely of cartilage, and that all of the cartilage of its nose is extremely resilient, much more than in the older child and considerably more than in the adult. Yet the rebound alone of these tissues would hardly be sufficient to explain the restoration of those extreme and bizarre distortions which one occasionally sees. Obviously there must be a greater force at work. This mysterious, potent force nature has bestowed upon all embryological tissue. This potentiality of a tissue to try to develop into the tissue or organ it is intended to be and also to return to normal after injury is known as totipotence (10).

The earlier the stage of life and development the greater the ability of the tissues to correct themselves. This power is greatest at the moment the ovum is fertilized. It diminishes rapidly after birth and becomes slight in childhood. Thus, apparently healed fractures and deformities at birth will tend to correct themselves, often in spite of the surgeon's unsuccessful operative attempts. Only here, as far as the nose is concerned, where the inherent, all powerful restorative powers still remain, has the physician a right to reservedly speak and say those terribly overworked, vacuous words, "Your child will outgrow it."

Statistically, one can make another interesting observation here. DeLee states that of all deliveries 95.9 per cent are vertex presentations. Of these 70 per cent are LOA (left occiput anterior), 29 per cent are ROA (right occiput anterior) and one

* Lutheran Hospital

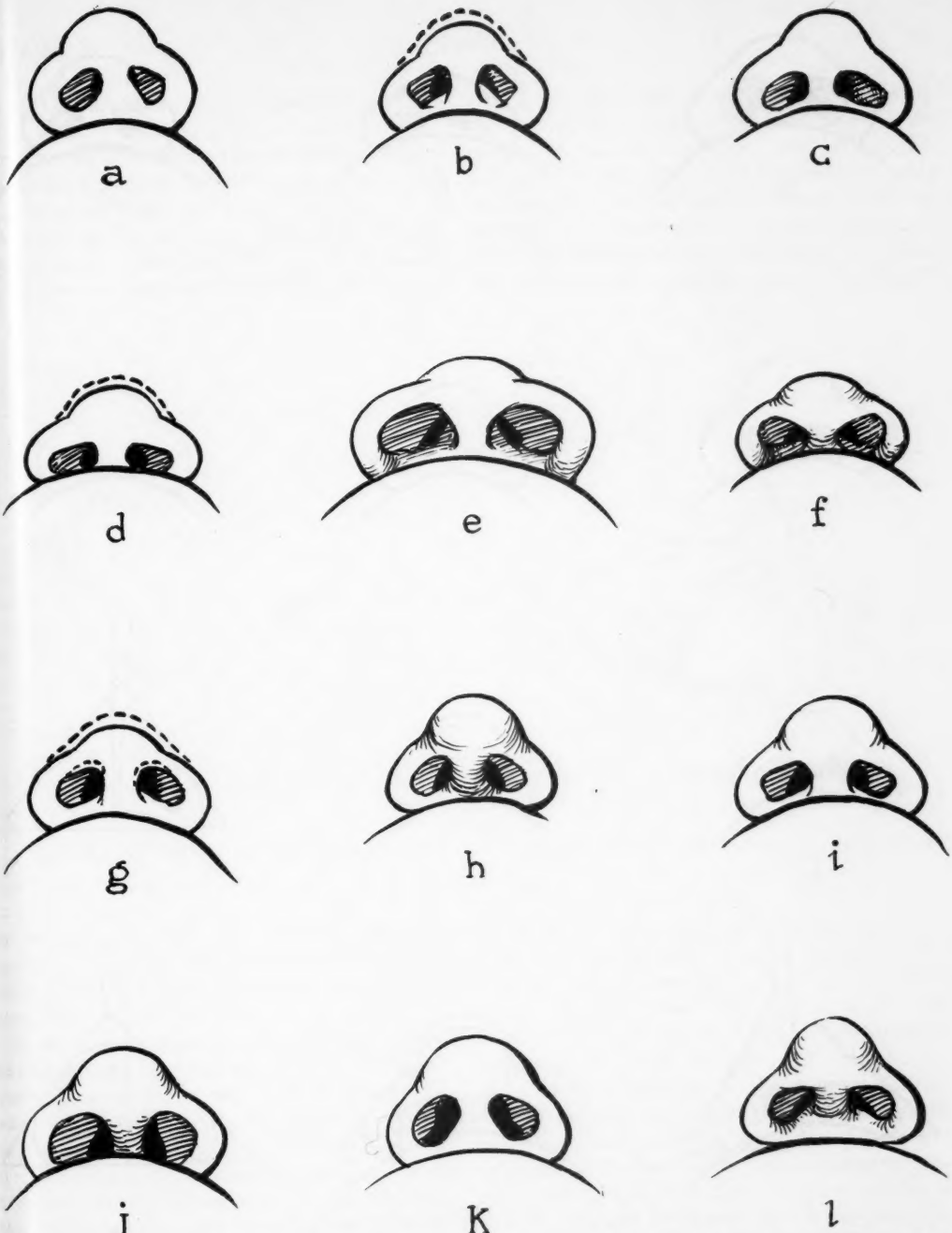


FIG. 4. Newborn Noses: a: ROA; Type II alae. b: ROA, nose compressed, left nostril tight; Type II. c: ROA, prominent lateral crus left vestibule; beginning Type II. d: ROA, left side of nose compressed; beginning Type II. e: LOA, negro; beginning Type II. Note: In the negro that which might appear to be footplate of alae joining with medial crus is actually aditus to vestibule. f: LOA, negro; beginning Type II alae. g: LOA, mid-forceps, nose compressed, round nostrils; beginning Type II. h: ROP, low forceps, retracted columella, slightly flattened tip; Type II. i: ROA, rectangular nostrils; Type II. j: LOA, nose markedly deflected to right at birth. Required oral airway for 48 hrs. to sustain breathing. Here shown 3 days postnatally with complete anatomical restoration; beginning Type II. k: LOA, note relatively large air spaces; Type II. l: LOA; Type II.

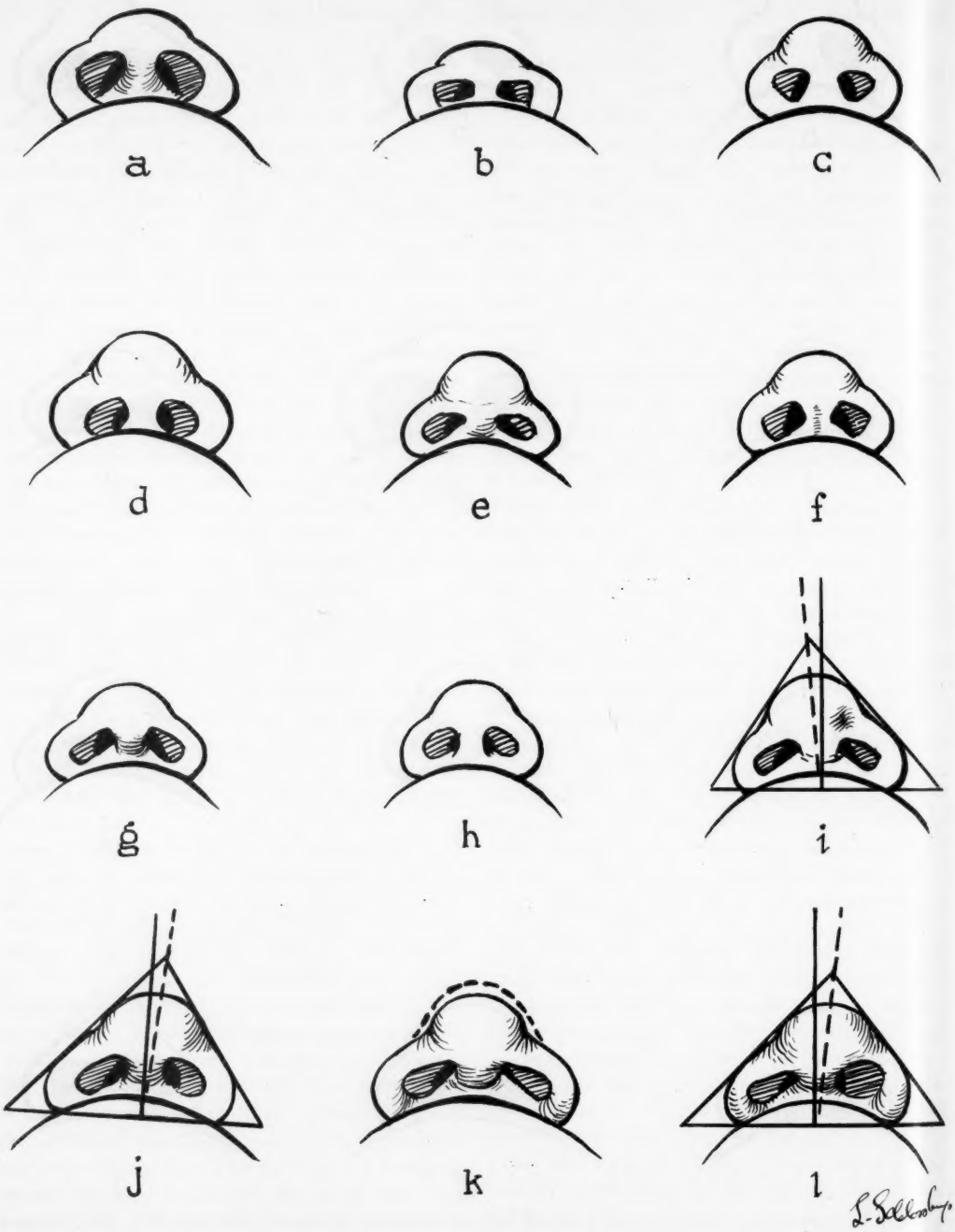
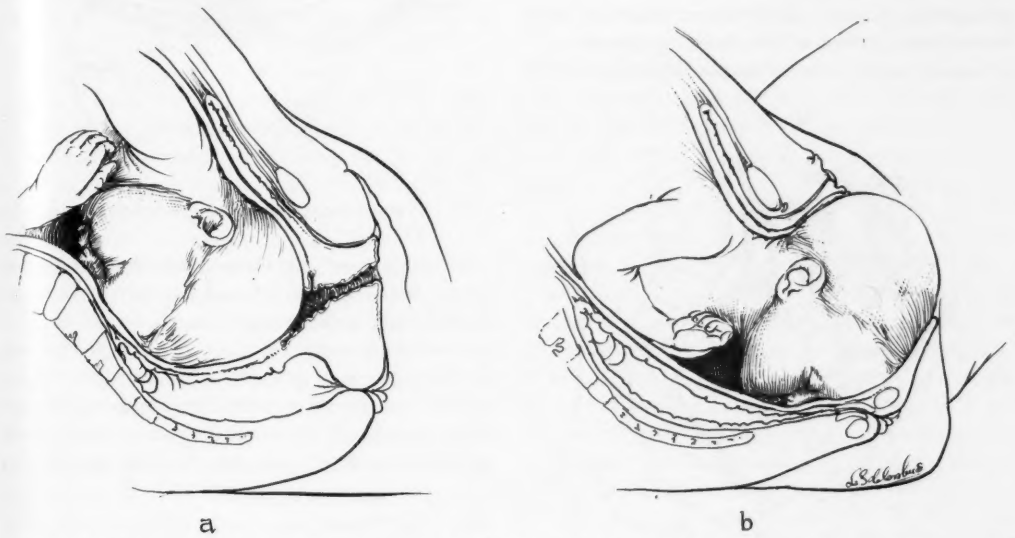


FIG. 5. Newborn Noses: a: ROA; Type II. b: Breech, spontaneous. Early fetal configuration; Type I. c: LOA, triangular nostrils; Type II. d: LOA, Type II. e: ROA; Type II. f: ROA, uterine inertia, square nostrils; Type II. g: LOA, mid-forceps; retracted columella, acute nasolabial angle, vertical diameter left nostril higher than right; Type II. h: ROA; Type II. i: LOA, nose displaced to right, prominent dimple, left anterior nares; Type II. j: ROA, nose displaced to left; Type II. k: LOA, nose compressed; Type II. l: ROA, nose displaced to left; Type II.

per cent other vertex positions. Breeches constitute 2.7 per cent, face and brow, 0.6 per cent, and transverse, 0.7 per cent. Most other authorities conform with similar findings, more or less. It is a well established fact the commonest deviations of a newborn's nasal pyramid is to the right (70 per cent to 85 per cent). Inevitably, in these cases, the cartilaginous septum is displaced from the vomerine groove to the left. This finds further corroboration in the fact that in most adults, with no obvious history of injuries, most deviations of the septum are to the left.



a b

FIGS. 6-a & b. Showing beginning of internal rotation in the LOA to complete extension. Note positional possibilities of nasal contact.

It would seem, therefore, that the vast majority of such deformities would occur during LOA presentations and to lesser extent in ROA presentations, where the nose is pushed to the left and the septum to the right. With the head in the LOA position as it is rotating with the nose pushed against the "rotating" portion of the pelvis, it is conceivable that with prolonged and excessive pressures enough force can be exerted against the projecting and flexible nose to create varying degrees of distortion and displacement (see Figure 6-a and b). Whether the deformity created will be permanent will depend upon the force exerted, the time this force is exerted against the nose, the individual and inherent tolerance which the nasal structures exhibit in withstanding physical insult, and the ethnic origin of the child. The noses of the Negro race (platyrrhine) and those of the yellow race (mesorrhine), being naturally flattened, can withstand greater pressures than the more prominent Caucasian (leptorrhine) noses. The internal structure of the black and yellow races is also considerably different and more readily permit the compression of the septum and cartilaginous vault. Also, it is the observation of a number of obstetricians that the heads of Caucasian infants are harder and mold with more difficulty than the heads of colored infants, which are softer and mold more easily (3).

In the vertex position with flexed head, theoretically, the greater the distance of rotation the greater is the possibility of trauma to the nose. The amount of prolonged pressure would, therefore, be greatest in the conversion of the occiput posterior position to occiput anterior, a distance of 135 degrees. The next greatest insult might take place in the rotation from the transverse occiput position to occiput anterior, a distance of 90 degrees. The least damage might be anticipated in changing from right or left occiput anterior to directly anterior, a distance of 45 degrees.

An important consideration in the etiology of nasal trauma, particularly in the vertex presentation, is that the distance from the tip of the nose to the occiput is frequently as great, sometimes greater, than the distance from the occiput to the chin (usually considered the longest head diameter). Measurements taken immediately after birth and repeated several days later show, in many instances, how these distances increase quickly one to two centimeters in those infants whose noses are flatter than is characteristic of their ethnic group (9).

Another causative factor proposed by an authoritative source, which may involve the fetus during labor and, more probably, prenatally during the latter months of pregnancy, is that of prolonged pressure of a fetal hand against the nose with resulting gross lateral displacement of the organ to varying degrees (figure 7). This may explain some of the deformities seen in instances where the labor had been easy and uncomplicated or the child was born prematurely or by a caesarean section (8).

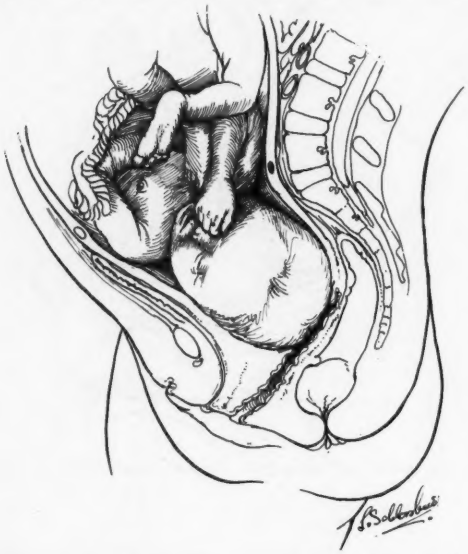


FIG. 7. Depicts the possible role of the fetal hand in exerting prolonged pressure against the nose.

The inadvertent or inexperienced misapplication of forceps may result in varying degrees of nasal trauma, some quite serious. There are cases on record where necrosis and actual sloughing away of the nose occurred due to such excessive trauma. Another complication of this misadventure is possible tearing of the tentorium (figure 8).

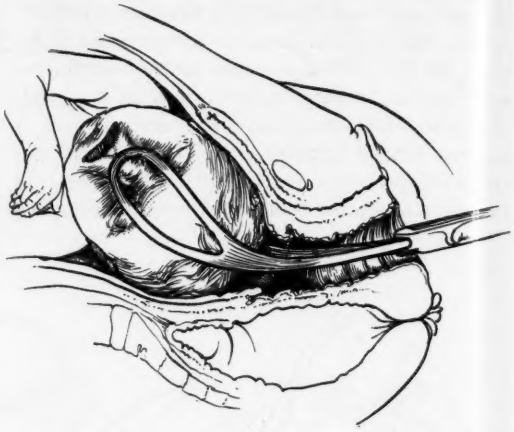


FIG. 8. Direct trauma to nose by misapplication of forceps.

Of much lesser significance would be the other presentations. A breech would hardly play any part in producing facial or nasal trauma. In the facial or anterior presentation the face comes straight through the birth channel, nose in middle, without making contact with the pelvic floor. The only direct pressure would be against the cervix, which is a soft organ. Maximum points of pressure would be against chin

FIG. 9. Brow anterior presentation. Note positional possibility of nasal contact under symphysis pubis.

and forehead. Often the face itself shows much edema. In a brow presentation, as the head is rotating, it is possible for the bridge of the nose to become engaged under the symphysis pubis with pressure changes eventuating (figure 9). Naturally, the more difficult and prolonged the labor, the greater is the possibility of a traumatic event.

Rarer complications of pregnancy which might conceivably cause varying degrees of nasal traumatic changes are diseases of the fetal envelopes, such as large single or multiple submucosal uterine fibroids, and oligohydramnion, where actually anything can happen. Deformities may involve the nose here, as well as any other presenting part or extremity; dystocia and anomalies of the bony pelvis with its manifold pathological classifications. The question of whether severe direct violence to the gravid uterus and its contents can cause trauma with deformity to the nose is highly debatable. There is no evidence in the literature to elaborate on this point.

In an effort to more fully understand and appreciate the normal fetal nose during its various stages of development, a study of many embryological specimens was undertaken (figures 10 and 11)*. Cottle has expounded on this subject in his lectures. For practical reasons the earlier formative stages were not used. Caucasian specimens were used almost exclusively, the occasional Negro nose being used for comparison. The base view was used because this area is best representative of the developmental characteristics. Enlarged Kodachrome® photographs and drawings were used to analyze the details. In general, a more or less standard evolutionary pattern was seen to emerge (12 to 15). This can be summarized graphically by the simple sketches demonstrated by figure 12 a–f. The phylogenetic implications are even evident in this group, although such changes are much more revealing and dramatic in the early formative stages not depicted here.

According to Arey (12) the development of the human face occurs chiefly between the fifth and eight weeks. When first formed the nose is broad and flat, with the small and pitted nostrils set far apart and directed forward. The entire base of the nose is tilted upward severely so the nostrils present in porcine fashion. In later fetal months the bridge of the nose is elevated and prolonged into the apex, and the nostrils point downward. Accompanying this relative narrowing of the nose, the head broadens between the eyes and causes them to be directed forward.

Figure 12-a represents the earliest *formed* type of nose. This is evident in the fetus about the seventh week (11½ mm. to 15 mm.—all measurements crown-rump), although characteristics of this type may be evident at somewhat later stages of development (figures 10-d and 11-d, pictures of a 16 week and 25 week old fetus respectively). This is the bifid nose and grossly represents the last remnant of clinical evidence that the nose is a dual organ composed of two conjoined tubes. Embryologically this is due to the fusion of the median and lateral nasal processes.

A somewhat later stage is shown in figure 12-b. Fusion is now completed and shows the nose at approximately the eighth to tenth week (23 mm. to 40 mm.). Here the nose is still flat, the nostrils are in the horizontal diameter and flattened. They are small compared to the thickness of the surrounding soft tissue nasal framework. The columella is short and thick. The alar feet stand on a broad base attached to the cheeks. Figure 10-l is of interest since it shows such primitive structure in a 158 mm. fetus (about 19½ weeks) with an associated lateral displacement, obviously a case of arrested development with an associated or superimposed intrauterine injury.

Figure 11-a shows the noses of a pair of 164 mm. twins who, from all appearances and findings, appear to be identical except for the nose. The nose on the left shows normal development, consistent with the chronological age of the fetus. The nose on the right demonstrates a more primitive configuration. Since the twins are identical it is quite probable that an intrauterine traumatic event could have influenced the arrested development here.

Actually, in these early stages one can often see a definite squareness to the nostril contour, as depicted in figure 12-c. Such angular architecture never develops at a later stage during the normal process of growth. Figure 10-f shows a fetus with such a nostril, and this 137 mm. fetus is probably the latest stage at which such contour develops, somewhere around the eighteenth week (figure 5-b).

* Acknowledgement is gratefully extended to Dr. Mary E. Rawls, of the Carnegie Institute of Washington, D.C., for her generous effort in assembling the embryological material in this study, and to Mr. Leon Schlossberg, of the Johns Hopkins medical institutions, for his artistic contribution.

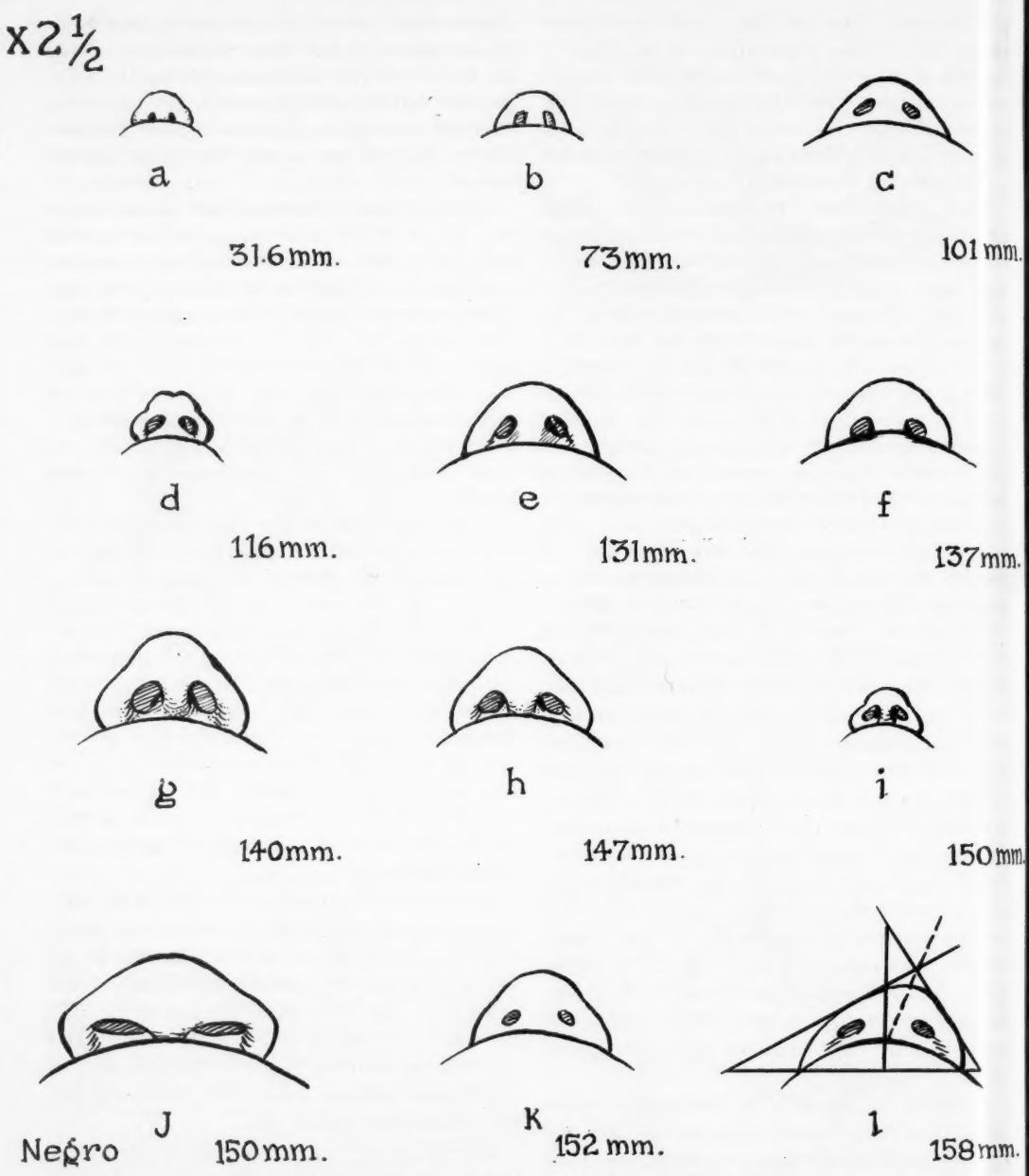


FIG. 10. This depicts representative phases in the embryological development of the human nose from the time that fusion is taking place (about the seventh week) until the thirty-fourth week.

As the development continues, the nostrils, which are now well formed, begin to assume an obliquity toward the columella, which is now becoming slightly longer. The alar feet begin to pull in slightly (figure 12-d). This is fully evident in the 16 week, 116 mm. fetus (figure 10-d).

Up to this point one could classify these forms as being of the early primitive type. Using the alar feet

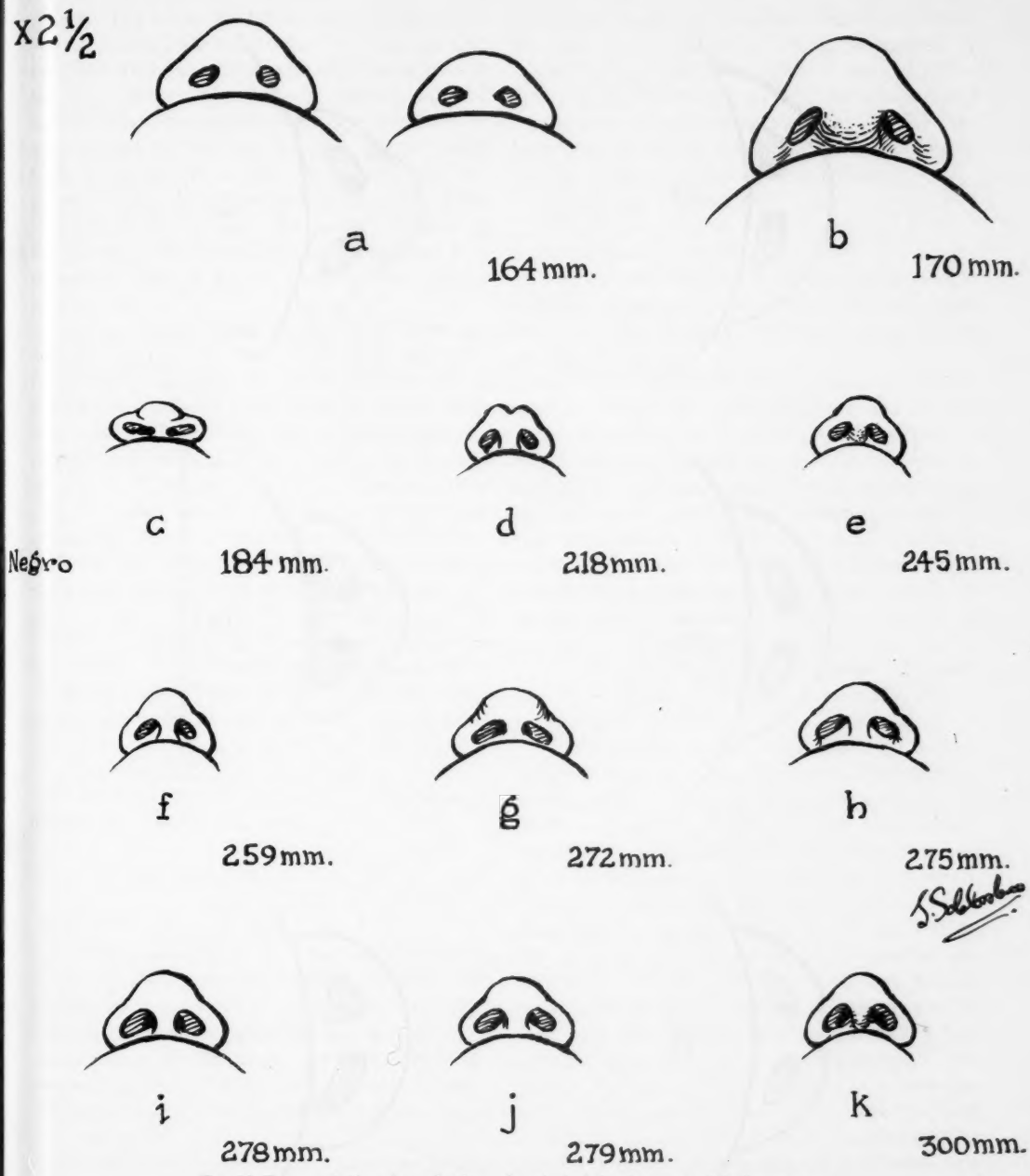


FIG. 11. Representative phases in the embryological development of the human nose

as a single point of reference, one can easily follow the progressive stages of nasal development from embryonic life into childhood. In the primitive phase the alar attachment is a straight and direct one on to the lip and cheek. This is position I of the alar footplate. As growth continues the footplate starts to turn in. In position II the alar attachment is halfway between the alar margin and the columella. These changes occur with great subtlety and many gradations of these positions occur.

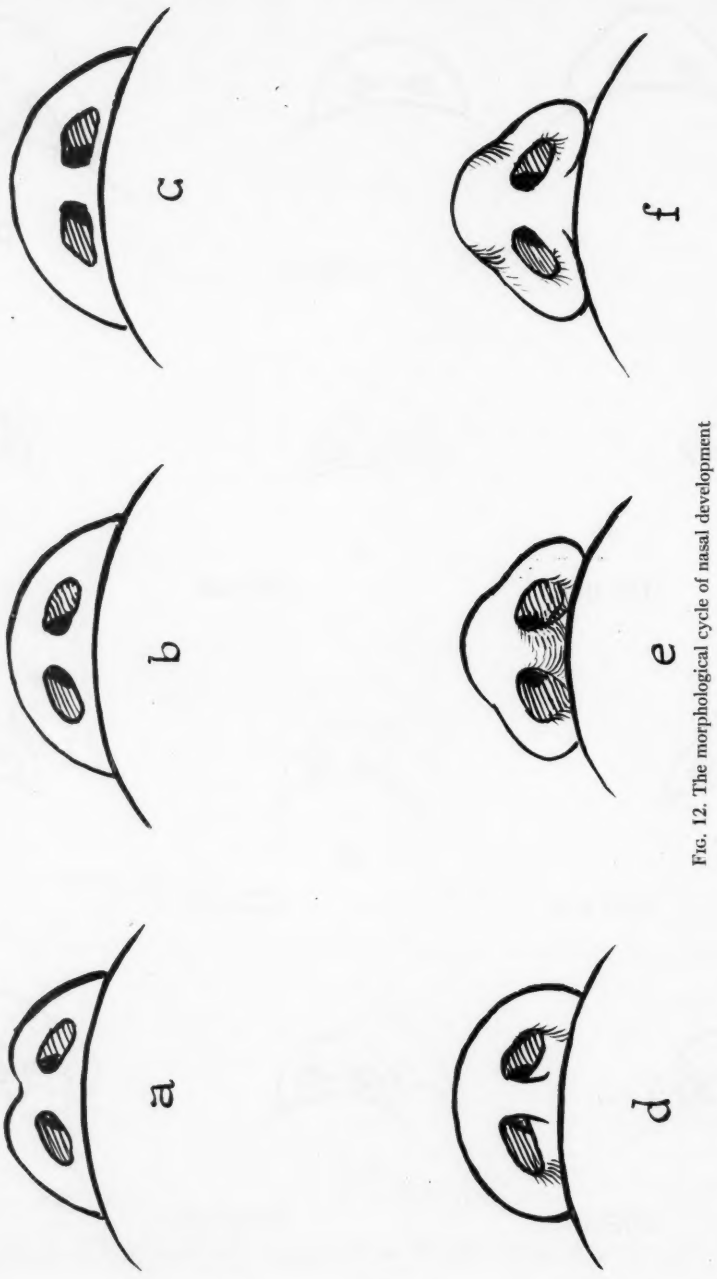


FIG. 12. The morphological cycle of nasal development

Figure 12-e shows this turning in of the alae. This process usually starts between the sixteenth and twentieth week. As the feet are pulled in the base of the nose assumes a more oval contour, and the nostrils become roundish with stronger tendencies to grow toward the vertical diameter. In this study most of the fetuses studied up to term had this general configuration of the nose, as did many of the newborns in the nursery. The earliest evidence in this study of the transformation from Type I to beginning Type II was in the 140 mm. embryo (figure 10-g).

Full maturation is shown in figure 12-f where the nose is normally and ideally developed. This configuration should begin to be evident by the time a child is seven or eight years, although it may occur much earlier. The nostrils are inclined toward the vertical enclosed in an oval formed by the graceful curving in of the alae as they blend imperceptibly with the more elongated columella. There is an appreciable increase in the projection of the nose.

In addition, as the nose matures the clinical nasal index and the tip index decrease. Conversely, the more immature the nose, the higher the index. The fetal index values are higher for all races during this stage of life. This also applies to childhood, where the values are less than in the fetal phase but higher than in adulthood. In other words, changes in nasal widths are most significant in the early development of individuals (9, 17). The nasal index is characteristic with different ethnic groups. The clinical nasal index is expressed by the formula:

$$\frac{\text{Maximum nasal width} \times 100}{\text{Total height}}$$

The width is measured by palpating the lateral walls of the pyriform aperture through the skin. The height is measured from the nasale to the subnasale. Calipers and a metric scale are used for the actual measurement. In the adult, according to Cottle, comparative figures for the clinical nasal index are:

Leptorrhines (which includes the Caucasian race)—61 or less

Mesorrhines (which includes the American Indians and the Orientals)—62 to 69

Platyrrhines (which includes the Negro race)—70 to 85

As previously stated, in children these values are all higher, and as they grow older they decrease.

The development of the lobule is expressed mathematically by the tip index. This is determined by measuring the width of the lobule at the level of the apices of the nostrils and dividing this measurement by the greatest width of the lobule as seen from the base view. The index is obtained after multiplying by 100. Average tip indices are as follows:

Leptorrhines—70 and less

Mesorrhines—70 to 80

Platyrrhines—75 to 90

As with the nasal index, the tip index in children is higher in all races. It is also obvious that all of these indices are much higher in the colored races than in the Caucasian race.

As Cottle (9) first pointed out, the clinical importance of these indices is as a means of evaluating disproportions which may result from injuries. Trauma may frequently cause a widening of the nose with an increase in the nasal and tip index. As his many observations and studies have shown, in general the nose functions best when there is greater consistency between anatomical configuration and ethnic origin. Nature has so endowed each race, each species of animal, that its physiologic functions will best be served by conforming to its foreordained genetic pattern. Noncomformity in nature results in freaks, and such creations often suffer from inferior constitutionality.

So it is with the human being who is apt to have a negroid type nose upon a Caucasian bony aperture or vice versa. Such nasal disproportions may well produce symptoms, syndromes, and nasal disharmonies (18). Injury during the prenatal-natal phases of life may initiate a host of developmental changes in the nose, either to the whole or its various parts. They may be quantitative as well as qualitative. The parts affected may undergo acceleration, deceleration, or a total arrest of growth. Any possible combination of these changes may be going on at the same time. For example, an adult may have a four year old lobule and a 15 year old bony vault. The septum may grow all out of proportion compared to the normal growth of the cartilaginous vault and eventually be the site of much deformity. The lobular cartilages may develop at a different rate than the upper lateral cartilages, or their various parts may pursue independent rates of growth. The fetal configuration of the lobule or the cute, pert tip of the young child may persist in adulthood although the entire nose has grown. That is, an adult may

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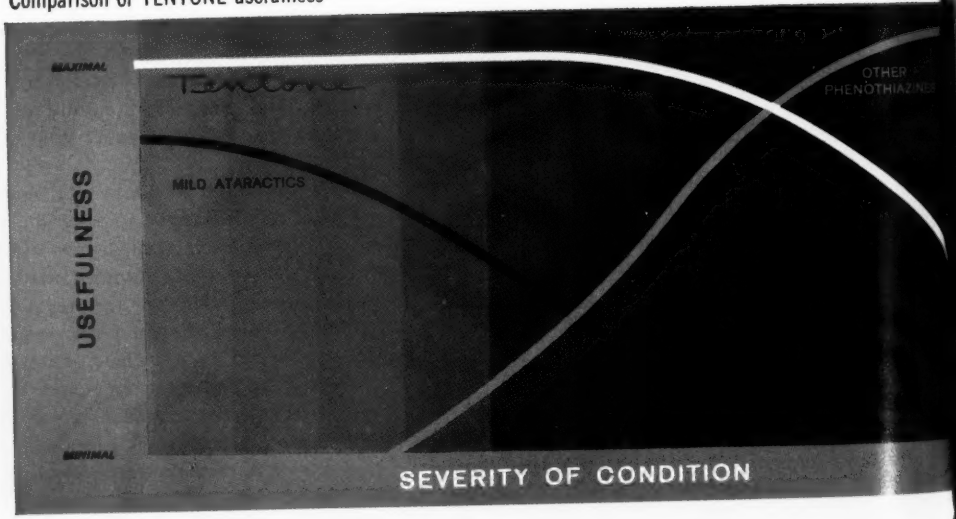

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have an infantile nose where there has been failure of development of one or all parts of the nose, which has grown large but has actually failed to differentiate into an adult type nose. A great many abnormal growth patterns and combinations are thus made possible.

Since the width of the nasal aperture does not achieve its ultimate narrowness until sometime during infancy, trauma may affect this part of the skeletal scaffolding in various ways, either to the whole or a part of it. Thus, in an extreme example, a leptorrhine nose may be built upon a bony foundation with platyrrhine qualities. One must not overlook the fact that an important growth and ossification center exists at the junction of the anterior end of the vomer where it meets the cartilaginous septum, the premaxilla and maxilla. The influence of early injury upon this center must be profound. An inevitable concomitant association with injury in this general area often will be such pathological findings as facial asymmetries, dental maldevelopments, and palatal deformities to varying degrees (9).

The art of medicine was developed through the ages along a dividing line, a critical boundary separating the normal from the abnormal, the healthy structure from the pathological entity. This science matured as the eye became more discerning in establishing these differences, and the highest development in clinical perspicacity today is measured in great degree by the ability to properly recognize that which is normal and that which is not. This knowledge can come only through many years of close and painful observation. This is particularly true in the case of infants and young children's noses, where so much diagnostic confusion exists. Minimal differences may create major problems. A difference of a mm. in the lumen of the nasal airway may mean an acute respiratory emergency; yet only one mm. of width may be all that will be necessary for normal breathing.

The purpose of the discussion on normal fetal nasal development was as a basis for demonstrating the abnormalities of nasal development in the newborn and young children. The normal newborn's nose is the end stage of the fetal evolutionary process. Any resemblance to the fetal nose in the newborn must be interpreted as being an abnormal manifestation probably representing an injury to the nose during fetal life. Thus, various stages of arrested development of the fetal nose may be represented in the newborn. The usual type of fetal arrested development is where the alar feet are in position I. This is the position where the feet insert into the lip and contiguous cheek rather than curving around into the nose. With this, of course, is the tendency toward horizontal nostrils and the flatness of the tip. If development is arrested somewhat later, then the alar feet curve inward somewhat toward the base of the nose and columella, but do not make the full curve characteristic of the highest development. Along with these changes, of course, are those which are related to the configuration of the nostril from horizontal to round or triangular and finally to the oval shape with the vertically inclined axis. As these nostril transformations occur the columella increases in length. More rarely the newborn may exhibit the primitive square nostril and even the bifid nose, a stage preceding the former, where fusion has taken place only partially or not at all.

With full realization of this information, one can predict in the newborn with reasonable certainty at which stage of development the injury occurred. This also applies to the adult distortions with infantile nasal characteristics, where the arrest in its growth may reflect some phase of the ontogenetic cycle all the way through any stage of childhood. Such knowledge will serve as the touchstone for better diagnosis, and through this a more intelligent approach to the medical and nonsurgical handling of nasal disease can be effected. The embryology and anatomy of deformity being understood, more accurate and appropriate surgical techniques can be devised and applied where necessary to these young noses. Correctly timed and properly applied, therapeutic measures in the very young repay the greatest health dividends in later life and provide one of the bulwarks of preventive medicine.

Summary

1. A study of the nose of the human fetus at various stages of development and of newborns was made. This was an attempt to establish some norm for comparison as it relates to the morbid anatomy of the nose injured during the intrauterine phase of development and in its descent through the birth channel.

2. Some of the etiological factors involved in the

production of nasal deformities in the newborn were discussed, as was the complexity and multiplicity of patterns these deformities may assume.

3. The clinical importance of the nasal indices was mentioned.

4. A plea for early and adequate care of these early nasal deformities was made, for that which may appear to be trivial to the unsuspecting eye may one day become a deformity of great clinical dimension.

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NASAL OBSTRUCTION IN THE NEWBORN AND YOUNG INFANT

ALVAN A. WELFELD, M.D.

Fortunately, bilateral nasal obstruction in the newborn is rare. The importance of nasal breathing in the newborn infant is not generally appreciated. Mouth breathing is an acquired habit. Bilateral nasal occlusion from any cause may result in severe respiratory distress and even death from asphyxia, especially in the first few weeks of life.

Warwick and Hastings (15) observed closely the breathing habits of newborn babies by obstructing the nose. They concluded that breathing takes place exclusively through the nose until the tenth to fourteenth day of life when the facility to breathe through the mouth develops.

Most infants are unable to survive unless they are able to breathe through their nose. Beinfield (3) emphasized this point in stating: "This can be demonstrated in the nursery by pinching the nostrils of a newborn infant when it is resting quietly. The infant in its natural attempt at forced nasal breathing will not open its mouth to breathe, but instead will close it tightly by sucking on its lips, completely cutting off its only source of air to maintain life. The infant will then become red in the face, toss its head from side to side and manifest signs of impending suffocation, until nasal breathing is again restored. This reaction does not occur with all infants, probably because some are mouth breathers from the onset. It may be the reason why some infants with bilateral atresia survive."

NASAL OBSTRUCTION DUE TO BILATERAL POSTERIOR CHOANAL ATRESIA

This congenital anomaly was first recorded by Otto in 1829 when he observed it at autopsy. The

anomaly may be unilateral or bilateral and consists of a bony or membranous partition between the nasal cavity and the nasopharynx.

In 1949 Hanchel (1) reviewed the published literature and found a total of only 235 cases of posterior choanal atresia reported. He stated that due to the rarity of this condition, one physician may see only one or two of these cases during his lifetime of practice.

After delivery, intermittent cyanosis with respiratory obstruction should make one suspicious. It becomes mandatory that the physician at the time of delivery be aware of this congenital anomaly, for the newborn infant with this defect may suffocate at birth unless an adequate substitution for the nasal airway is established.

When it occurs it constitutes a medical emergency. Prompt diagnosis must be made and treatment immediately instituted. A No. 8 French rubber catheter can be passed without obstruction through the nose into the oropharynx of a normal newborn. In the infant with posterior choanal atresia the catheter will not pass into the nasopharynx and the oropharynx because of the atresia of the posterior nares. Passage of a small metal probe through the nasal cavity will be blocked before it reaches the nasopharynx. Instillation of dye into the nasal cavity will not reach the oral cavity, and this is a helpful confirmatory procedure. Lipiodal studies (see photographs) is also another aid in confirming diagnosis.

Once a diagnosis of bilateral posterior choanal atresia has been made, measures should be taken to keep the infant's mouth open at all times. This may be done by tying an infant sized oral anesthesia airway in place. Should the oral airway prove inadequate a tracheotomy is indicated.

Controversy has arisen regarding the advisability of immediate operation in the newborn. Richardson (17) advocated operation be deferred until the second year if possible. Loeb (18) and Lemere (19) believed immediate operation is preferable if the bone is not too thick. Cinelli (20) felt the infant should receive expert pediatric care for a period of two years before surgery is attempted (4 to 9).

Because of the rarity of this condition one man sees only a few of these cases in his lifetime, and a trial of all of the described corrective surgical techniques is not possible. Many surgical approaches to permanently correct this obstructing defect have been advocated.

Morrow (11) reported four instances of bilateral posterior choanal atresia operated on the first, second, and sixteenth day of life, respectively. The fourth died of multiple anomalies. One patient was operated on by the transpalatine approach and the other two by an intranasal approach. Once openings were established polyethylene tubings were kept in place from the anterior nares to the soft palate. This was followed by choanal dilatation and all three children did well.

Case Reports

Bilateral posterior choanal atresia, multiple congenital anomalies

Baby B, born January 11, 1956. This newborn infant, immediately after birth, had four or five bouts of apnea which were relieved by artificial respiration, laryngeal exposure and suction and later by intubation. It was noted by one of the house officers that a small rubber catheter could not be passed through the nose into the pharynx on either side, and he suspected bilateral congenital posterior choanal atresia. An infant size oral airway was tied into place and the infant was able to breathe spontaneously.

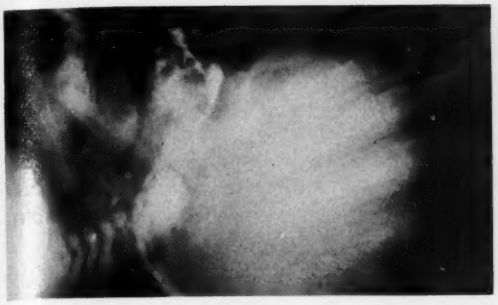
On examination the infant was found to be breathing quietly with the plastic oral airway strapped into place, establishing an airway from the hypopharynx through the mouth to the outside. As soon as the plastic airway was taken out of the baby's mouth he became apneic and cyanotic. When it was reintroduced into place the infant was able to breathe again.

On examination of the nasal cavities, when a No. 8 catheter was inserted into the nose it could not reach the nasopharynx because of an obstruction in the region of the posterior choana. This obstruction existed on both sides. A small metal probe was then inserted into the nose on each side and it too encountered a firm obstruction in the region of the posterior choana and could not be passed into the nasopharynx.

The diagnosis of bilateral, congenital, complete posterior choanal atresia was confirmed.

Nasal breathing is instinctive. Mouth breathing must be acquired and does not usually occur within the first two weeks of life.

To maintain the life of the infant either an airway would have to be kept strapped into the baby's mouth until it learned mouth breathing, or a tracheotomy would have to be done. We had



(Baby S.) Lipiodol instilled in the right and left nasal cavity respectively, fails to enter the nasopharynx or oropharynx due to obstruction bilaterally because of posterior choanal atresia.

planned to keep the tracheotomy tube in place until mouth breathing had been acquired. Surgery of the choanal atresia would be done as soon as it was felt the infant would be able to withstand this procedure.

An emergency, orderly tracheotomy was done in the operating room under no anesthesia, an endotracheal tube inserted during the operative procedure and a No. 0 tracheotomy tube was introduced into the trachea in the usual manner. The tracheotomy was uneventful and the infant left the operating room in good condition.

Respirations remained irregular and labored, became apneic twice again but responded. At 6:45 a.m. on January 12, 1956, respirations and heart sounds ceased.

At autopsy multiple congenital defects were found:

Atresia of choanae, bilateral
Pulmonary atelectasis, partial, bilateral
Partial aplasia of diaphragmatic musculature, right
Incomplete bicuspid aortic valve
Prematurity
Patent foramen ovale
Patent ductus arteriosus.

Bilateral posterior choanal atresia, multiple congenital anomalies

Baby S., born August 4, 1956. The patient was delivered to a 39 year old para 3-2-0-1-2, 38 weeks pregnant. The child was born by breech presentation. It had primary apnea for two minutes, secondary apnea for two to four minutes while lying on the mother's abdomen, and had irregular respirations for another three to four minutes.

After birth a diagnosis of bilateral choanal atresia was made, since repeated bouts of apnea aroused this suspicion. Small catheters could not be passed through either nasal cavity. There were other congenital defects including oxycephalia, hydrocephalus and syndactylia.

An oral airway was inserted into the mouth and the bouts of apnea disappeared. The infant was transferred to the pediatric ward, where it remained until death (about two months). During this period the main problem with the child was maintaining an open airway, feeding and intercurrent infections. It was tube fed most of the time.

On August 19, 1956, the airway was taken out for a brief period and the child became cyanotic, gagged and was in acute respiratory distress. When the airway was reinserted, its color and respirations immediately returned to normal.

On October 13, 1956, after a period of several infections, respiration ceased. At post mortem examination the following provisional anatomical diagnoses were made.

Multiple Congenital Anomalies:
Atresia of cerebral aqueduct.
Interanal hydrocephalus, obstructive, lateral ventricles and third ventricle.
Microgyria, frontal lobes, bilateral.
Enlargement of superior sagittal suture.
Syndactylia of hands and feet.
Complete fusion of right third and fourth metacarpal bones.
Disorganization and absence of multiple middle and distal phalanges, bilateral hands and feet.
Marked adduction and extension deformities (equinus) of forefoot.
Fusion of first and second right metatarsal bones.
Arthrogryposis of upper and lower extremities.

Sacral spina bifida occulta.
Marked stenosis of posterior choanae.
Diverticulum of trachea.
Diaphragmatic hernia, right, small.
Mobile cecum.
Large redundant mesentery of colon. Mesenteric cyst.
Patent foramen ovale.
Bronchopneumonia.
Pulmonary edema and congestion.
Atelectasis of bases of right lower lobe and left lower lobe of lung.
Dilatation and hypertrophy of right auricle and ventricle.
Acute congestion of liver and spleen.
Fatty change of liver.

Comment

These two cases of proven bilateral posterior choanal atresia presented classical symptoms of respiratory distress (apnea) at or immediately after delivery. The immediate problem of potential suffocation was relieved by establishment of a substitute nasal airway. An infant oral airway tube immediately relieved acute respiratory distress. A tracheotomy was shortly thereafter performed in the first case. Unfortunately, the multiple major congenital anomalies compounded the problems and both infants later died.

Others have reported choanal atresia associated with congenital heart disease (14).

Nasal Obstruction due to Unilateral Posterior Choanal Atresia

Unilateral posterior choanal atresia is often not diagnosed. The only symptoms may be an accumulation of thick, tenacious albuminous mucus on one side. Sometimes the infants seem to have a constant cold, or are "snorters" when they breathe. If the clear nostril becomes accidentally blocked during nursing, they exhibit respiratory distress.

These symptoms should arouse suspicions and careful rhinologic investigation. Inability to pass a small catheter through the suspected side affords a presumptive diagnosis which can be confirmed with lipiodol x-ray studies.

Beinfield (21) concluded that perhaps unilateral posterior choanal atresia accounted for infants found dead in their cribs or carriages, with a diagnosis at autopsy of "cause unknown." He reasoned that if an infant with unilateral choanal atresia is placed on its abdomen with its face in a pillow, there is an ever present risk of the clear nostril being accidently occluded. This consequently produces bilateral nasal occlusion, apnea and suffocation. There are no supporting statistics, but it is a reasonable presumption and may encourage more careful post mortem examinations of the nasal cavity of infants in which death followed suffocation of unknown cause.

Surgical correction of unilateral posterior choanal atresia is advisedly delayed until adulthood.

Posterior choanal atresia may be complete or incomplete, and symptoms produced in the incomplete group depend upon the actual size of the lumen in the posterior choana.

Unilateral, posterior choanal atresia, incomplete

Baby C. W. examined January 9, 1956. This one month old infant had a history of nasal snorting and an accumulation of mucoid secretion in both nostrils since birth. On examination the infant snorted both on inspiration and on expiration through the nose. There was a moderate amount of mucus in both nasal cavities. A No. 8 French catheter was passed through the left nostril into the nasopharynx. On the right side the catheter could only be introduced for one half inch, where it met a firm obstruction. A fine malleable metal probe could, however, be passed beyond this point of obstruction into the nasopharynx.

Impression

This infant had an unilateral choanal atresia on the right which was incomplete. It was probably bony since the metal probe met with firm resistance, except where it passed through the small lumen in the obstructing wall.

Treatment

It was planned to treat this infant conservatively until adulthood. At that time the structures would be much larger and more accessible surgically.

Impending Asphyxia in an Infant from Nose Drop "Rebound"

King (10) reported a case of a seven week old infant who developed either a "rebound" or an allergy to 0.12 per cent Phenylephrine Hydrochloride (Neo-Synephrine®) nose drops. After two days use the infant developed swollen obstructing nasal mucosa associated with nasal blockage. The child became

cyanotic, and this acute respiratory distress was relieved by opening the child's mouth and holding the tongue down with the finger.

In order to maintain at least one patent nasal airway at all times, nose drops were continued in one side only. This permitted nasal breathing through this side while the other nasal cavity recovered spontaneously. When this second side maintained its patency without the use of drops, the drops were discontinued in both sides.

This case again emphasizes the importance of nasal breathing in the infant.

Nasal Obstruction due to Reserpine Administered ante Partum

Budnick, Leikin and Hoeck (12) report 12 infants whose mothers had received Reserpine therapy antepartum and were observed to have developed nasal discharge, nasal obstructive phenomenon and retraction in every case. Cyanosis was evident in the most severe cases. Oxygen and Trendelenburg's position were the most efficacious therapy. Nasal decongestants, antihistamines and, in some cases, antibiotics were also used but without much effect. There were two deaths, in one of which the drug appeared to have a contributory role.

Nasal Obstruction due to Infection

Potter states that the nose is rarely the site of infection in the newborn period, and upper respiratory infections are uncommon until the child is several months old.

Marked nasal obstruction in several newborn infants almost immediately after birth due to hemolytic streptococcus infections has been described.

Moncreiff (16) in 1936 described two cases of complete temporary nasal obstruction in infants shortly after delivery, causing respiratory distress, use of the accessory muscles of respiration and cyanosis. These, he reported, were due to "infective rhinitis," since choanal atresia could not be demonstrated. One case was treated with "dilatation" of the nasal airways with a catheter for three days. The other was treated with the instillation of menthol with paraffin. Both infants recovered promptly.

Nasal Obstruction due to Trauma in the Newborn

Sluder (27) pointed out that during birth the nose, being the most protruding feature of the face, is exposed to trauma far more than the rest of the face. Despite its elastic pliable consistency it is probably frequently injured. The most prevalent injury of the nose is displacement of the cartilaginous septum out of the vomerian groove. The infant may have some nursing difficulty and impairment in nasal respirations (25).

Ehrenfest (26) cautioned that application of forceps to an unrotated head lying high in the pelvic inlet may result in fracture of one or both nasal bones. He also referred to nasal fractures occurring in spontaneous labor.

Cottle (24) has pointed out that injuries to the nose may be prenatal, occurring perhaps months before labor has begun, and resulting in a well marked, completely healed deformity with or without dislocation of the nasal tip and nostrils. Unless there is complete inability to breathe and eat, expectant waiting is advised. He also called attention to the nasal deformity acquired during delivery, usually associated with a flattening of the nose from compression and dislocation of the septal cartilage from the vomerian ridge. This problem was again reviewed by Kirchner (23).

While these reporters described deformities of the nose in the newborn, no reference has been found producing complete nasal obstruction as a result of trauma and resultant edema of the nose. In discussing this potential problem of nasal obstruction due to trauma of the nose in the newborn with a number of obstetricians of long experience, none had seen nasal trauma or edema at birth sufficient to produce bilateral nasal obstruction.

The following case report may possibly belong in this category.

Case Report

Bilateral complete temporary nasal obstruction due to edema of the nasal septum—etiology not known.

Baby G. This newborn baby had an uneventful delivery. Presentation was right occiput anterior, and Simpson forceps were used. Just prior to delivery the mother received Nembutal® 200 mg., Scopolamine® 0.6 mg., Sparine® 25 mg., and Demerol® 75 mg. During the latter months of this pregnancy the mother had been given small amounts of Dexamyl® and a small quantity of paregoric. There was no family history of allergy.

Immediately after delivery the newborn had

dyspnea and was placed in a croupette with moist oxygen. The color and dyspnea improved. Within 48 hours it was evident that the infant was in acute respiratory distress, retracting and unable to breathe through its nose. These symptoms were dramatically relieved by placing an oral anesthetic airway into the mouth. It was thought that the symptoms were produced by choanal atresia.

However, the examiner was able to pass a no. 10 Fr. plastic catheter from the anterior nares into the oropharynx on both sides. This would rule out the possibility of a choanal atresia.

The anterior portion of the nasal cavity was visibly blocked. The anterior nasal septum was in actual contact with the region of the upper lateral cartilage on both sides.

It was not certain whether this represented septal edema of unknown cause—Trauma? Allergy?—or just a congenitally small anterior nasal cavity. In any event, it was advised that the oral airway be continued until either nasal breathing becomes adequate or the baby learned to breath through its mouth.

The nose was symmetrical; the nasal mucosa was not inflamed, and nasal secretion was scant.

Within 48 hours the baby was able to breathe through its nose for long periods of time without assistance from the oral airway. The thickness of the visible anterior septum had decreased, and the air space of the anterior region of the nasal cavity was approaching normal.

For the next 48 hours the infant was completely comfortable with no respiratory distress, no cyanosis, no retraction.

It was felt this had been a complete anterior nasal obstruction due to septal edema which had subsided spontaneously.

During the episode the infant had been afebrile and the blood count was normal. Unfortunately, a nasal culture had not been obtained.

Summary

Nasal breathing is essential to survival in most newborn infants. Bilateral nasal obstruction of any cause in the newborn and young infant usually produces acute respiratory distress, apnea and suffocation. This condition must always be considered in the differential diagnosis of causes of respiratory distress in the newborn and young infant.

Should bilateral nasal obstruction be present, the respiratory distress may be relieved by taping or tying an ordinary anesthetic oral airway in place into the infant's mouth.

Bilateral nasal obstruction due to bilateral posterior choanal atresia is reviewed, and two cases of this anomaly are presented.

Nasal obstruction due to unilateral posterior choanal atresia is reviewed, and one case of unilateral posterior choanal atresia, incomplete, is presented.

Other causes of nasal obstruction in the infant are reviewed. These include impending asphyxia in an infant due to nose drop "rebound," nasal obstruction due to Reserpine® administered antepartum, and nasal obstruction due to infection.

Nasal obstruction due to trauma in the newborn is discussed and a case history of nasal obstruction due to edema of the septum is presented.

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COBALT 60 TELETHERAPY

With Special Reference to Laryngeal Carcinoma and Complications in Treatment

N. EDWARD NACHLAS, M.D.*

Cobalt 60 teletherapy is essentially a form of supervoltage x-ray therapy and is, for all practical purposes, identical to two to three million volt x-ray generators. Because of the great expense of supervoltage units, high dosage was limited to a few radiological centers. However, with the advent of cobalt 60 therapy, the high cost was brought within the means of most hospitals.

The first kilocurie cobalt 60 therapy machine was produced in Canada in 1951. Estimates have been made that there will be 1200 machines in world service in 1961 (1). The cobalt 60 is prepared by placing thin discs of pure metallic cobalt .5 mm. thick and 2½ cm. in diameter in a high reactive flux atomic pile; the cobalt captures neutrons and becomes radioactive (2). The half life of cobalt 60 is 5.3 years. The cobalt 60 is constantly emanating gamma rays, and leakage is a highly important factor (3). Constant watch is necessary. Since the widespread use of cobalt 60 has been fairly recent, as previously noted, there is still need for definite uniformity of dosage. It was realized in the writing of this paper that many of the dosages are on an experimental basis and the findings may be changed with changes in technique (4). Studies are now being carried out by The National Committee on Radiation to determine the adequate dosage of cobalt 60.

Because the tendency to side scatter is less with cobalt than with conventional x-ray, the volume of normal tissue irradiated is smaller (5). Therefore supervoltage therapy increases the effectiveness of radiation by allowing larger deep dosage with decreased skin involvement. There is also less absorption and marked decrease in constitutional disturbances. It has been noted that marked alteration in the red count, white count, platelets or differential count is rare when small tissue volumes are irradiated with cobalt 60. When the first results of cobalt 60 were published, the general trend of opinion was highly favorable; however, recent reports indicate cobalt 60 therapy is not proving as efficient in the number of five year cures as was first hoped. It has been found that tumors which are radiosensitive to conventional therapy are usually sensitive to the supervoltage therapy, but to a higher degree. Those tumors that are radioresistant to medium voltage therapy will be resistant to supervoltage therapy, with few exceptions. Thus, in carcinoma of the larynx good results with super-radiation tend to be better than with conventional radiation in selected cases. In those far advanced cases with extensive metastasis, results do not seem to be significantly better. In many types of carcinoma, treatment with conventional x-ray or radium is still the treatment of choice.

Since the clinical experience in the use of cobalt 60 teletherapy is relatively limited, the first reports being published only in the past few years, an accurate summary of the clinical advantages is still to be determined. Time will be the chief factor in ascertaining the true effectiveness of cobalt 60 therapy.

In this report the author pays special attention to carcinoma of the laryngopharynx and complications. Additional references are given for those interested in the use of cobalt 60 in other types of malignancy.

A review of the literature revealed few cases of long term treatment. One of the first men to report the use of cobalt 60 beam therapy was Ivan Smith (6, 7). After approximately five years of experience

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he stated, "Cobalt 60 has not revolutionized the treatment of cancer." He did feel, however, that the effectiveness of radio therapy has been expanded. His best followup studies thus far have been in carcinoma of the larynx. He reported 13 cases of intrinsic carcinoma grades 2 and 3, indicating extension of the disease process beyond the cords. Six of his series were extensions in the subglottic region. He did not include cases with metastasis or inoperable extrinsic carcinoma. Observing his cases from 17 months to 4 years 10 months revealed the following: Eleven patients of the group are still living. In his opinion there was minimal reaction to the treatment, and he felt that the intrinsic group of carcinoma of the larynx without metastasis should be treated primarily with radiation. Surgery should be withheld for complications or recurrence after the cobalt 60 beam therapy.

Perryman and Evans reported that cobalt 60 therapy seems to give encouraging results in treatment of carcinoma of the larynx, but they did not give specific figures. Burkell and Watson (11) used cobalt 60 in three patients with intrinsic carcinoma of the larynx with unfavorable results. There was gross edema of the laryngeal structures with perichondritis requiring tracheotomy. All three of the patients died. They changed their technique and felt that overall reaction was lessened with the changes. They treated eight cases of intrinsic carcinoma of the larynx, and again severe initial reactions occurred. At the time of their publication only three of their eight original patients were alive. As a whole, they felt that the results of cobalt 60 therapy in this type of cancer were disappointing. Fletcher (8), without citing specific figures, felt that early epidermoid carcinoma of the vocal cords could be handled as well with the 200 kv. machine as with cobalt. In the treatment of more extensive extrinsic or intrinsic tumors of the larynx, if laryngectomy is refused, then cobalt 60 teletherapy will increase the possibility of cure over that with the 200 kv. machine.

Case Report 1

A 49 year old Negro male was first seen in June 1948. He complained of pain in the throat, hoarseness and difficulty in swallowing, of approximately six months duration. He was hospitalized, and laryngoscopy revealed an infiltrating squamous cell carcinoma of the vocal cord on the right side extending to the pyriform sinus. The patient was treated with cobalt therapy from June 1958 to August 1958. After the therapy he had increased difficulty in swallowing, lost about 50 pounds and was rehospitalized on October 3, 1958. A laryngoscopy was done and revealed complete necrosis of the mucous membranes of the laryngeal cartilages, perichondritis, and gross edema of the epiglottis. The patient was given intravenous fluids and supportive therapy and was finally discharged from the hospital. A laryngectomy was considered on this patient but was withheld in view of the complications which had occurred in other patients.

Case Report 2—J. S. (Dr. A. S.)

This 66 year old Negro female was seen complaining of hoarseness of one year duration. There was no history of dysphagia or weight loss. Physical examination showed a tumor of the right vocal cord with extension to the anterior commissure. Both cords were mobile. On May 21, 1957 a biopsy revealed squamous cell carcinoma. On June 20, 1957 a bilateral thyrotomy was done. The patient made a good recovery, but a subsequent biopsy showed the presence of carcinoma. On October 29, 1957 a biopsy of a neck gland was negative. The patient was referred for cobalt 60 therapy. The patient received tumor dose of 5200 r. On November 26, 1957 a total laryngectomy was done. There was excessive fibrosis, copious bleeding and a complete loss of normal fascial plane structure. Pathology report showed extensive irradiation fibrosis and ulceration of the mucosa. No tumor tissue was identified. Fistula formation started almost immediately postoperatively, and the tissue slough became more and more severe. The fistula was approximately three-fourths of an inch in diameter. Plastic surgery consultation recommended repair of the fistula with pedicled graft. There have been ten plastic operations to date and the fistula is still present.

Case Report 3—M. C. (Dr. J. S.)

This Negro female was first seen on March 13, 1957, complaining of hoarseness and swelling in the neck. Chest x-ray was clear. The laryngeal lesion was hard, swollen, nonulcerated area on left aryepiglottic fold (extrinsic). Four biopsies of the larynx were negative, but biopsy of a neck gland showed squamous cell carcinoma. Patient was

referred for cobalt therapy in April 1957 in preparation for surgery. She received 33 days of therapy. Her appetite improved. Examination of larynx revealed slight residual edema in the left aryepiglottic region and left vocal cord fixation. On September 5, 1957, because of the high ratio of recurrence of lesions in this area, a total laryngectomy was done with a left radical neck dissection. Postoperatively the skin began to become necrotic in almost the entire extent of the flap. On October 10, 1957 there was rupture of the exposed portion of the internal carotid artery, while the patient was on the hospital elevator, being transported to the operating room for one of her many plastic procedures. The prompt action of a nurse in compressing the neck, plus the fact she was on the way to the operating room saved her life. The artery was ligated and was found to be completely thrombosed cephalad to the site of the tear. Reconstructive surgery was instituted and patient is still undergoing operations. Patient received 6800 r in six weeks from April 11 to May 24, 1957.

Case Report 4—C. L. (Dr. J. S.)

This 52 year old Negro male was first seen complaining of hoarseness of several months duration. Examination showed a fixed left vocal cord covered with polypoid growth. There were palpable glands in the left carotid triangle. A biopsy on May 17, 1957 reported poorly differentiated squamous cell carcinoma. On June 5, 1957 a total laryngectomy and left radical neck dissection was done. Pathology reported carcinoma of the larynx and metastasis to parajugular lymph nodes. He was discharged from the hospital after an uneventful recovery and was referred for cobalt 60 therapy. Two months after receiving the therapy a fistula began to form and the skin flap began to necrose. Pathology report of the skin around the fistula was necrosis. He was readmitted to the hospital on November 20, 1957 for repair of the fistula. He has, to this time, undergone 26 operations. Patient received 5000 r from July to August 29, 1957 conventional 220 kv.

Case Report 5—H. M. (Dr. A. W.)

This 57 year old white male was seen several times and treated for sinusitis. He had recurrent sore throats and in November 1956 complained of a sore throat of several weeks duration. In December 1956 he complained of pain in his ear and an ulcerated area was noted in the pre-epiglottic space. In January 1957 an ulceration was noted in the region of the junction of the epiglottis and the base of the tongue. Biopsy revealed squamous cell carcinoma. Patient was referred for cobalt therapy and received 6000 r over a six week period. Following therapy patient developed an esophageal stricture with difficulty in swallowing. An attempt was made to bougie the esophagus to relieve the stricture. However, patient's difficulty increased, and finally gastrostomy was done. Several weeks later patient was admitted to the hospital in a coma and died May 18, 1958. Cause of death was pneumococcal meningitis and radiation necrosis of the upper third of the esophagus.

Discussion

There is marked susceptibility of the normal mucosa of the esophagus and respiratory tract to radiotherapy. This susceptibility is apparently just as severe with cobalt 60 teletherapy. Esophagitis is a common complaint when the esophagus is in or near the tumor and is included in the beam (9). Tissue necrosis may occur as late as six months after the treatment, especially if large areas are radiated. In cases where there is little chance for favorable prognosis, such as carcinoma of the esophagus, perhaps the chance of complications incurred with cobalt 60 is worth taking. There is really nothing else to offer the patient, and reports are appearing that its use in carcinoma of the esophagus are encouraging (10).

However, in carcinoma of the laryngopharynx, where the results are so good with surgery, one must stop and think before submitting the patient to such treatment. The complications in the few cases herewith presented were of such a severe and debilitating nature that one must certainly consider the high morbidity. This was found to be especially true where a combination of surgical and x-ray therapy was considered. With large areas of tissues being irradiated, the lack of skin change is actually misleading. With conventional x-ray the skin assumes a typical burned appearance, but with supervoltage x-ray the skin appears normal in spite of the skin devitalization and will lead the surgeon into serious complications he might have avoided. Tissue devitalization has been found to be much higher with supervoltage than with conventional x-ray

therapy. The tissue devitalization has been found to be especially true of mucous membrane linings. As stated before, with changes in the technique of administrating cobalt 60 teletherapy, perhaps the complications will be less severe. Certainly the extensive necrosis, desquamation, fibrosis and general destruction of the tissue encountered were complications not reported by all people using cobalt 60.

SUMMARY

1. Cobalt 60 teletherapy is a form of supervoltage x-ray therapy similar to that delivered with a two to three million volt x-ray machine. It offers no specific action on tumor cells. Its principle benefit is in enabling the delivery of increased tumor dosage because of better tolerance of skin and underlying tissues.

2. A series of five cases treated with x-ray therapy, four with cobalt and one with conventional radiotherapy are presented.

3. Complications occurring in this series of cases included bone and cartilage necrosis, esophageal fistula, esophageal stricture, skin and tissue necrosis, rupture of the carotid artery and periesophageal abscess.

4. Treatment of carcinoma of the laryngopharynx should be decided by close cooperation between the radiological and surgical departments. Full consideration should be given to the possible hazards of combined therapy.

5. The knowledge of the marked tissue devitalization with supervoltage therapy, in spite of the lack of skin changes, will save the surgeon from serious complications.

6. From the findings in the series of cases herein presented and a review of the literature, it is felt that surgery is still the treatment of choice of carcinoma of the laryngopharynx.

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BRAIN ABSCESS FOLLOWING SUBMUCOUS RESECTION OF THE NASAL SEPTUM

Report of a Case

ALVIN D. RUDO, M.D.*

The occurrence of a brain abscess after submucous resection of the nasal septum is apparently rare, and is, therefore, the reason for this report. The circumstances leading to the formation of this abscess are unique. Like so many of the complicated situations that are read in a novel, similarly there are those in patients that sometimes point to the villain or at least allow an expectation of doom. The abnormal complications of this individual to surgical therapy are fortunately unique and rare.

Undoubtedly, brain abscess has followed surgery of the nasal septum before, but the literature of the past 20 years is devoid of specific references. Abscess

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caused by diseases of the ear and nose is not uncommon. In a series of 77 brain abscesses treated at the University Hospital, Copenhagen, 1935–1948, 21 originated from the ear or nose, according to Schmidt. Of these cases, eight were considered caused by sinusitis. Pennybacker reports 56 out of 110 abscesses due to disease of the ear and nose, with ten due to frontal sinusitis. He remarks that the abscess can form two or three days after the onset of the infection without capsule formation or five to six weeks afterward with capsule formation.

It has been axiomatic to avoid fracture in the area of the cribriform plate during septal and ethmoid sinus surgery. The consideration involved, I believe, was to avoid a meningitis by this breach of technique. Abscess was considered more remote as a sequela.

McCaskey has organized the following list of rhinogenic causes of brain abscess. It is noteworthy that he, too, does not include mention of abscess following septal surgery.

1. Acute upper respiratory illnesses with purulent sinusitis.
2. Chronic sinusitis with acute exacerbation.
3. Dental surgery in the presence of maxillary sinusitis.
4. Fractures involving the sinuses.
5. Puncture wounds involving the sinuses.
6. Surgery performed in the presence of acute or purulent sinusitis (leads to osteomyelitis of the skull).
7. Furunculosis of the anterior nares or angle of the nose.

The pathways or routes of infection are postulated as being along the perineural sheaths, the lymphatics, thrombophlebitic veins, and possibly through recent or old lines of fractures.

Rhinogenic abscess of the brain is rare. Encapsulation of the abscess is necessary for recovery. The organisms most responsible are staphylococcus albus hemolyticus, staphylococcus aureus hemolyticus, streptococcus hemolyticus, streptococcus subacidus, streptococcus subacidus hemolyticus, gram negative bacillus, and pneumococcus. Aerobic organisms favor encapsulation, whereas anaerobic do not.

Chronic sinusitis is said to be more likely to cause extradural or subdural abscess, whereas sinus surgery is more likely to cause frontal bone osteitis and probable frontal lobe abscess.

The number and intensity of symptoms are commensurate with the degree of increasing intracranial pressure. Headache and vomiting are almost always prominent. Stupor and disorientation precede coma. The specific neurological disturbances are naturally related to the location of the abscess. Frontal lobe abscesses produce slight neurological abnormalities (motor) and speech aphasia. Temporal abscesses cause pain, possible aphasia, visual field disturbances, and possible neurological motor and sensory disturbances of more generalized nature. Cerebellar abscesses produce nystagmus (slow component to the side of the lesion, on lateral gaze), possible dysarthria, hypotonia, ataxy, and dysdiadochokinesia. Cerebellar abscesses may also cause strabismus and slight trigeminal or facial nerve impairment.

Case Report

A 29 year old white male was admitted to the hospital on April 23, 1956. He complained of chronic nasal obstruction and headache for six months. The headache occurred mostly in the middle of the day and was relieved by lying down. Frequent sore throats and upper respiratory infections were noted. Anterior nasal and postnasal discharges were present. Chronic nasal obstruction had been present since a boxing injury in 1947, while with the U. S. Marine Corps. A submucous resection of the nasal septum had been attempted subsequently at the U. S. Navy Hospital, but was discontinued after partial completion because of an apparent hysterical and/or drug reaction.

The past history was significant only in that pneumonia was present in 1955, and a neck mass was removed in 1938.

Physical examination revealed the following positive findings:

1. There was injection of the left tympanic membrane in the area of the malleus.
2. There was evidence of previous removal of part of the nasal septal cartilage.
3. There was hypertrophy of the left inferior nasal turbinate with mucopurulent debris in the nose.
4. There were decreased deep reflexes of the upper extremities and increased reflexes of the lower extremities.

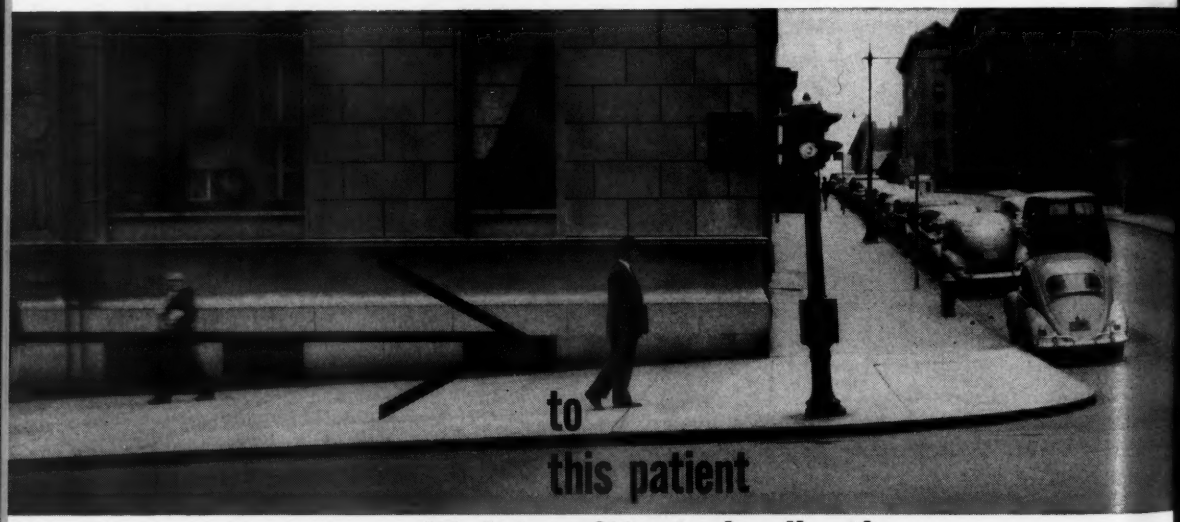
Submucous resection of the nasal septum was performed under general anesthesia on April 28. The only difficulties encountered were firmness of ad-

herence of flaps of septal mucous membrane and partial atresia on the right by adhesions of septum to middle turbinate.

Postoperatively he continued to complain of excessive headache, although analgesic tablets seemed to control them. Vomiting on the first postoperative day seemed somewhat excessive. Headache seemed minimal by discharge on May 9. Temperature course was normal.

He was admitted to Mercy Hospital on June 27, complaining of headache, frontal and occipital, with nausea and vomiting for several days. Headache had been present from the date of nasal surgery until two weeks before this admission. Although spinal fluid showed a 2 plus reaction to the Pandy test and protein of 75 mg. per cent, he was discharged with the diagnoses of psychoneurosis and tension headache. His course was afebrile. Workup was otherwise normal, except for positive cephalin flocculation tests. An electroencephalogram, made on July 14, was reported abnormal, and he was readmitted to the hospital on July 18. He became uncoordinated, lost interest in work, and then disoriented. The Babinski test was positive on the left, questionable on the right. Knee jerk was considered more brisk on the right. The leukocyte count was 11,000 cubic millimeters; 94 per cent segmented. A left frontal trephination was performed on July 20, and an abscess aspirated. Escherichia freundii was cultured from the material aspirated. The following day the patient was alert, but had a persistence of left facial weakness, diplopia, and right abducens weakness. The next day he was disoriented. On July 23, a craniotomy was done, and an abscess excised from the right frontal area. The abscess mass was reported to extend under the falx cerebri and into the right cerebellar area. This also was excised. He remained confused for approximately one week. He was discharged from the hospital on August 17.

He was admitted to Perry Point Veterans Administration Hospital on April 13, 1958. His employer had found him useless on the job. His temperament had become "animalized" since the brain surgery. He was hostile, with many fluctuations of mood,



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and his memory was poor. He had been diagnosed as "chronic brain syndrome, with remission of psychotic reaction at time of admission, and now manifested by behavioral reaction consisting in distractibility, fluctuating and irascible mood, extra punitive behavior with explosive features, syncopal convulsive equivalents, and persisting electroencephalographic abnormalities. These manifestations are active, and the patient is incompetent."

It is obviously *not* clear that septal surgery was the cause of this frontal lobe abscess. The time interval incriminates the nasal surgery, but the sequence of events is confusing and inconsistent with a clear-cut etiology. The history of previous drug or behavioral reaction at the first operation, the long history of headache, and especially the location of the abscess in the falx and cerebellar areas are facts to be reckoned with. They are difficult to place clearly in this puzzle.

SUMMARY

Rhinogenic brain abscess is rare.

Reports of brain abscess following septal surgery are absent in modern literature.

A case is presented, in which a left frontal abscess occurred. It was discovered 12 weeks after nasal septal surgery.

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Component Medical Societies

ALLEGANY-GARRETT COUNTY MEDICAL SOCIETY

LESLIE E. DAUGHERTY, M.D.

Journal Representative

Dr. Butt Joins Staff at Memorial

Dr. F. H. Butt has joined the medical staff of Cumberland's Memorial Hospital, thus marking the first time in the medical history of Allegany county that an anesthesiologist has been employed full-time by a hospital.

Dr. Butt received his AB degree at Johns Hopkins Hospital, Baltimore, and his M.D. degree at the Jefferson Medical College, Philadelphia. He recently completed a course in anesthesiology under Dr. George Thomas at St. Francis General Hospital, Pittsburgh.

A native of Pittsburgh, Dr. Butt is married and the father of three children.

Fifth Generation Becomes Practicing Physician

Arthur F. Jones, Jr., Oakland, formerly of Cumberland, recently became the fifth generation of his family to become a practicing physician. The line of descent includes his father, Dr. Arthur F. Jones, Sr., Garrett County health officer; his late grandfather, Dr. Emmett Jones, Sr., long a well-known doctor in Cumberland; his great-grandfather, Dr. Albert Jones, who settled in Florence, Alabama; and his great-great-grandfather, Dr. Frederick Jones, who started his practice in Tennessee and later settled in Florence. Dr. Emmett L. Jones, Jr. of Cumberland, is an uncle.

Dr. Jones received his M.D. degree at the University of Maryland and plans to take his internship at University Hospital in Baltimore.

Garrett County Physicians Host to Allegany-Garrett County Medical Society

A regular meeting of the Allegany-Garrett County Medical Society was held in Oakland, Maryland, on August 12. Dinner was served in the William James Hotel. An excellent number of members turned out. Dr. William M. Cooper, hematologist and associate clinical professor of medicine at the University of Pittsburgh, gave an interesting and informative talk on "Isotopes in the Diagnosis and Treatment of Bleeding in the Gastro-Intestinal Tract." His talk was highlighted by slides.

Left to right: Dr. A. E. Mance, chairman, Program Committee; Dr. W. M. Cooper, speaker; Dr. L. B. Ransom, president, Allegany-Garrett County Medical Society.

Dr. A. E. Mance, of Oakland, was chairman of the Program Committee.

Many of the doctors' wives were present. At the business meeting, there was a unanimous vote to sponsor a chapter of the Ladies Auxiliary.

Oakland can be depended upon to have 10 to 15 degrees cooler temperature than the rest of the county, and on this particular day it was just that. While all other Garrett County folk were sweltering, many of our members were enjoying boat rides on Deep Creek Lake or a round of golf on the magnificent golf course.

We look forward to this visitation in Garrett County by the County Society.

Personals

Dr. Charles Conrad Zimmermann, member of the Baltimore and Ohio medical staff, recently attended the presidential address on the "State of the Railroads." Discussion of medical problems followed a luncheon period, at which Dr. Zimmermann was a leader. New methods of examining sight and hearing were discussed. Other subjects included "Mouth to Mouth Artificial Respiration in Resuscitation." The present company's medical staff is composed of 42 physicians and surgeons, of which Dr. Zimmermann is a member. The railroad further employs 455 physicians as company surgeons on a fee basis;

several of them are residents of Allegany and Garrett Counties.

Dr. George M. Simons and family, of Cumberland, have returned from a three week vacation at Fenwick Island, Delaware. Other vacationists: Dr. Leslie R. Miles, of Lonaconing, recently spent two weeks at Virginia Beach, Virginia; Dr. James P. Hallinan and family, Cumberland, enjoyed a stay at their summer camp in Cacapon Park, Berkeley Springs, West Virginia, and Dr. Emmett L. Jones and family, of Cumberland, have returned from a month's vacation at Deep Creek Lake, Oakland. Dr. and Mrs. L. Lewis Mould, Cumberland, vacationed during August at Lake Simcoe, Orillia, Canada.

Dr. L. Michael Glick and his wife, Dr. Gina M. Glick, have opened offices for the practice of medicine in Cumberland. Dr. Michael Glick, a native of Cumberland, graduated from the University of Maryland School of Medicine in 1954 and interned at Mercy Hospital, in Chicago. For the past year he served as chief resident in medicine and clinical instructor in the Department of Medicine at the Chicago Medical School. Dr. Glick will limit his practice to internal medicine. Dr. Gina Glick, an anesthesiologist, received her M.D. in 1956, from Stritch School of Medicine of Loyola University, Chicago and served her internship at Mercy Hospital there. She served her residency in anesthesiology at Chicago Wesley Memorial Hospital, of Northwestern University Medical School.

Dr. Hilda Jane Walters, of Frostburg, has recently returned from a vacation in New Mexico. A nephew, Alvin J. Walters, Jr., M.D., who is a graduate of the University of Iowa, served during her absence. He has just completed his residency at Little Rock, Arkansas.

Dr. Ton Van Strien, Allegany County Health Officer, flew to Holland to accompany his wife and three children back to the United States. Mrs. Van Strien and children sailed to Holland in April to visit their families, and they returned to the States by plane in September.

Dr. Ruth Peachy, who formerly practiced in Grantsville, Md., has been appointed to the staff of West Chester Division of New York Hospital. Dr. Peachy recently moved to White Plains, N. Y.

BALTIMORE CITY MEDICAL SOCIETY

CONRAD ACTON, M.D.
Journal Representative

The Executive Board, at its regular July meeting on the fourteenth, conferred with Dr. Webster Brown, chairman of the Committee to confer with Insurance Carriers. Several months ago a group of medical insurance carriers in the Baltimore area wrote about overcharges by physicians, one recent graduate in particular. Dr. Brown's committee made a careful examination of the basis of these grievances. After hearing the details, the Board elected to have a special meeting in the near future where both parties could be heard.

The Committee on Public Medical Education, Dr. Martin Singewald, chairman, reported a resolution expressing its desire to change the focus of its efforts. This committee feels there is "too much public medical education" assailing the public by every possible modality: direct mail, press, radio, and television. The committee desires to concentrate instead on recruitment of high school students for medicine as a career. The resolution was accepted for introduction, after editing, at the Faculty's Semi-annual Meeting in September.

Dr. Classen, secretary, reminded the Board of the Forand Bill then in Congressional Committee hearings. The Board voted to oppose this bill and directed the secretary to write to our senators and representatives asking them to vote against it.

Dr. Kimberly, treasurer, called attention to the sad financial status of the Committee on National Emergency Medical Service, Dr. I. Ridgeway Trimble, chairman. Until a local director of emergency services is designated, no funds from city or state emergency services can be allocated. As a result, the committee has no funds with which to pay secretarial or other help. The committee work is being carried on entirely at the expense of the state and city medical societies and the committee members themselves. The State Medical Society can no longer continue to support this financially. Dr. Kimberly recommends the City Society consider continuing its help. The Board discussed this at length, particularly as to the setting of precedents, and decided this cause was so worthy they would extend partial financial support a few months at a time as needed. It is a remote hope that if an

appropriation should be made, some of the monies advanced might be regained.

The remainder of the session was concerned with amplification and qualification by Dr. R. Walter Graham of his remarks concerning Sinai Hospital, as quoted by the recent press. The press had quoted him as advocating the purchase of the Sinai Hospital site by the city as a good and advantageous investment. The press further quoted him as stating the purchase of the site would prevent physicians' making a "meat house" of it, and that "the medical examinations for licensure are archaic and obsolete, allowing unqualified men to enter medicine." Dr. Graham, in his frank and forthright manner, regretted the bad public reaction to his statement. He claimed to have been misquoted and quoted without permission as well. This misquote referred to his objecting to the medical licensing "law." He declared that the present Board of Medical Examiners did as well as the law permitted. He stated that the aspect of the present law to which he objected was the licensing of recent graduates to practice "medicine and surgery" after passing an examination. He stated that this permitted such licensees to take care of "any kind of medical or surgical problem or operation" which he might or might not have been trained to do. Dr. Graham said it was his opinion that some further legal restraint should be imposed on physicians to restrain them from attempting procedures beyond the scope of their competence. He did not say how he proposed to do this by changing the law.

Dr. Graham made no bones about the fact that the recent Reddick example was a case in point. He went further to decry the type of care doled out at some nursing homes at high rates. Dr. Graham was cooperative and expressed himself as sincerely sorry "that his efforts on behalf of the people of Baltimore had evoked a hue and cry" far from his intended purpose, but added, "I am a little blunt and say what I think." He reiterated that the Sinai site acquisition was a worthy one, a good investment for the city at the price, and that in time he hoped to help it succeed.

The Board recognized Dr. Graham's obvious sincerity and sympathized with his predicament. A formal statement to the press was considered, but it was ultimately agreed that "the less said the soonest mended," and no statement was authorized. On the Board's part there was no criticism of Dr. Graham's purpose.

Dr. Richard T. Shackleford, chairman of the Program Committee, announced that his program for January is firm. Dr. Lewis Thomas, professor of physiology, University of the City of New York, will talk on "Mechanisms of Tissue Damage in Disease."

BALTIMORE COUNTY MEDICAL ASSOCIATION, INC.

WILLIAM H. F. WARTHEN, M.D.
Journal Representaitve

At the June meeting of the Baltimore County Medical Association, following a vigorous address, Dr. Clarence E. McWilliams presented to the incoming president, Dr. J. Morris Reese, the gavel of office and the traditional golden-headed cane, which is a symbol of the high ethics of our profession in Baltimore County. The following officers were inducted by Dr. McWilliams:

Dr. J. Morris Reese ..... President
Dr. Margaret Lee Sherrard ..... Vice President
Dr. John M. Rehberger ..... Secretary-Treasurer

BOARD OF GOVERNORS

Dr. J. Morris Reese
Dr. Margaret Lee Sherrard
Dr. John M. Rehberger
Dr. Robert Ensor
Dr. Clarence E. McWilliams
Dr. William H. F. Warthen

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Melvin B. Davis	Charles H. Williams
Martin E. Strobel	George S. M. Kieffer
Frank T. Kasik, Jr.	John Gessner
Clarence E. McWilliams	A. Bradley Daugherty
Frederick A. Holden	Thomas Wheeler

President J. Morris Reese has named the following Committees for the official 1959–1960 year:

Standing Ethics, Credentials and Membership

Louis Dalmau, Chairman
Clarence E. McWilliams
William A. Pillsbury

Program and Scientific Work

Margaret Lee Sherrard, Chairman
Robert Ensor
Mary E. Matthews

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Special Journal Representative

William H. F. Warthen

School Health Coordinating Council

Melvin B. Davis
Charles F. O'Donnell
William A. Pillsbury

The Annual Crab Feast of the Baltimore County Medical Association was held August 19 at Duffy's Restaurant, in Baltimore, and the spirit of conviviality seemed, if possible, to be even greater than in former years.

FREDERICK COUNTY MEDICAL SOCIETY

LOUIS R. SCHOOLMAN, M.D.

Journal Representative

Our society affairs lapsed into the annual summer doldrum during July and August. We had an unofficial gathering July 22 as guests of the Frederick County Bar Association. Following the usual "tranquilizer," we enjoyed a charcoal broiled steak, set off with fresh tomatoes and corn on the cob. The tables were set on the terrace of the Gambrill Park Lodge, overlooking the Frederick and Middletown Valleys, nearly 1,000 feet beneath. The weather was good, the food and drink excellent, and our hosts most cordial; in all, a memorable evening.

MONTGOMERY COUNTY MEDICAL SOCIETY

CHARLES FARWELL, M.D.

Journal Representative

With the perspective a little distance in time gives, the year 1958 can be seen from the viewpoint of our historian, Dr. K. Chapman.

During 1958, the eight regular meetings of the Montgomery County Medical Society were held at the Norbeck Country Club, with the president, Dr. William T. Joyce, presiding. The average attendance at these dinner meetings was 134. In November a dinner dance was held at the Woodmont Club, with an attendance of 264. The topics of the scientific papers were as follows:

Social Security
The Toxemias of Pregnancy
Information on the Ancillary Services of Medicine
The Anemias—Problems in Diagnosis and Therapy
Public Relations in the Doctor's Office and the Community
Film on Diabetes Mellitus
Treatment of Chronic Liver Disease
Diarrhea in Infants and Children

On January 1, 1958 our membership was 333. During the year 46 new members were added and 10 were dropped by resignation. There were no deaths among the membership, but the death of a former member, Dr. Stieglitz, occurred last June. The net gain for the year was 36, making the total membership as of December 31, 369.

Our policies during the year included approval of the Jenkins-Keogh Bill (building up of a retirement program for the self-employed); disapproval of including self-employed doctors under Social Security; objection to the zoning regulations influencing the number and location of doctors' offices; supporting the state Medical Care Program; accepting the raising of state medical dues; checking the safety of x-ray machines in doctors' offices; active participation in the activities of the newly formed Medical Council of the Washington Metropolitan Area. Discussion was continued on the threat of socialized medicine, the handling of emergency medical calls, and the mass immunization against polio. Our stand on the latter subject was published in an open letter printed in all our

county newspapers. Clinics jointly sponsored by the Medical Society and the Health Department were held during the early summer. The annual discussion of changing the place of meeting also came up.

Other business matters included the appointment of Dr. Whitmer B. Firor as councilor assigned from the State Society for Montgomery County. Considerable progress was made on the medical setup for a large scale disaster. The insurance plan for the Board of Education was tabled for the time being.

Our society has been criticized for the fees charged for school accidents under the Child Accident Plans, Inc., of Baltimore. Rescue squads and the press continue to criticize the way Emergency Medical Service handles their calls. We have been warned of the increasing number of narcotic addicts coming into the county and have been told to contact the police in case of any suspicion. The press criticized us for refusing to cooperate with women's club groups in mass polio immunization.

An attractive change this past year has been made in the format of our Medical Society Bulletin. In April 1958 the Bulletin came out in a 16-page edition, and by December of 1958 it had increased to 28 pages with its now familiar gold and blue cover. During the year original articles by the following members have been published: Drs. H. H. Mitchell, Austin B. Rohrbaugh, Jr., DeWitt DeLawter, Henry Laughlin, Murry Robinson, Charles Warfield, Marvin L. Kolkin and Read N. Calvert. A series of biographies started in the December issue with Dr. Harold H. Mitchell featured.

Honors have come to many of our members during the year 1958:

Dr. Boyer was made a member of the State Council.

Dr. Cross and Dr. Jaeger are on the Civil Defense Evaluation Committee, and Dr. Cross was on the nominating committee of the State Medical Society.

New Fellows of the American College of Surgeons include Drs. James R. Thistlethwaite, Thomas G. Edison and Arthur F. Woodward.

Dr. George Cohen has been made a member of the American Academy of Pediatrics.

Dr. Savarese is the director of the new Poison Control Center at Suburban Hospital.

Drs. Rohrbaugh and Angle are members of the Board of Trustees of Suburban Hospital.

Dr. Crawford Brown is chairman of the Board of Directors of the Montgomery County chapter, Maryland division, of the American Cancer Society.

Dr. Ligon has been appointed to the County Welfare Board.

The Montgomery County Tuberculosis and Heart Association has Dr. Traum as third vice president and Drs. Geiger and Warthen as board members.

Dr. Farwell is medical director of Montgomery County Planned Parenthood, and Dr. Avron Maser is a new board member of the same association.

Dr. William S. Murphy is a new member of the board of directors of the Montgomery County chapter of the American Red Cross.

Dr. J. W. Peabody, Sr., received the college medal and certificate of award from the American College of Chest Physicians.

Dr. Rohrbaugh is president of the Montgomery County Society for Crippled Children and Adults.

Dr. Joyce was made vice chairman of the Medical Council of the Washington Metropolitan Area.

Dr. Maxwell is assistant editor of the Bulletin of the School of Medicine at the University of Maryland.

Dr. Schnebly is on the board of directors of the Silver Spring Lions Club.

Dr. Irene Tamagna is on the Medical Advisory Board of the D. C. Area chapter of the National Multiple Sclerosis Society.

The Maryland Academy of General Practice had Dr. K. Chapman as a vice president in 1957–58 and Dr. Gordon Smith in 1958–59.

Dr. Klopp retired after three years as president of the D. C. division of the American Cancer Society.

Dr. Caulk is a delegate to the A.M.A. from the D. C. Medical Society.

Dr. Naples was elected grand commander of Alcantara Caravan, Order of the Alhambra.

Dr. William S. Murphy was elected to the board of directors of the D. C. chapter of the Arthritis and Rheumatism Foundation.

Appointments to the Medical Care Commission include Drs. Rohrbaugh, Laughlin and Cross.

Dr. Lorenz made his boards.

Drs. Hartley and Cohen have been made life members of our Society.

Obituaries

Norman B. Cole, M.D.
1886–1959

Disgnostician and specialist in circulatory diseases, Dr. Norman B. Cole died August 18 in Nantucket, Mass. He was 73.

A native New Englander, Dr. Cole was an alumnus of Harvard University. He was a medical officer during World War I and became chief of medical service at the United States Army General Hospital No. 2 at Fort McHenry.

Dr. Cole collaborated with his former partner in practice, Dr. Lewellys Barker, in the writing of two books, one on blood pressure and the other on rheumatism. He was medical director and secretary and a board member of the Baltimore Life Insurance Company. His professional affiliations were with the Baltimore City Medical Society, the Maryland Society for Medical Research, and the American Association of Medical Directors. He was on the board of the Travelers' Aid Society of Baltimore and of the General German Orphan Home in Catonsville.

By avocation, Dr. Cole was a youth leader, having worked with Baltimore boys since 1912. He was actively associated with the Boy Scouts and held various positions, including president of the Baltimore Area Council of the Boy Scouts. His experience with the problems of youth led to his serving on the School Board from 1934 to 1946.

Dr. Cole was a bachelor. He is survived by cousins.

Page Edmunds, M.D.
1872–1959

Dr. Page Edmunds, a retired surgeon, died August 7 at the age of 87. He was for many years professor of industrial surgery at the University of Maryland School of Medicine, and was appointed professor emeritus upon his retirement in 1946.

Dr. Edmunds was born in Leonardtown, in St. Mary's County. He graduated from the University of Maryland Medical School in 1898, having worked on a Cheseapeake Bay steamer to help finance his education. After several years of general practice in Baltimore, he went abroad to study urology in England, Germany and Austria. Upon his return to Baltimore he became chief surgeon for the Baltimore and Ohio Railroad and the Washington, Baltimore and Annapolis Railroad.

During World War I he was a Medical Corps officer, serving in France. Instead of joining with other veterans in the jubilant Armistice Day celebration on November 11, 1918, Dr. Edmunds was on duty back of the front lines near Verdun, France, where he performed 30 operations.

In 1907 Dr. Edmunds married a graduate nurse, Millicent Geare, who now survives him.

Dr. Edmunds was a member of the American College of Surgeons, the American Board of Surgery, and the Splint Club, a doctors' group whose membership is limited to 25 members.

William H. Fisher, M.D.
1881–1959

Queen Anne's County physician and medical examiner, Dr. William H. Fisher, died August 4, at the age of 78. He had practiced medicine in Centreville for 54 years.

Born in Princess Anne, in Somerset County, he received his M.D. in 1905 from the University of Maryland School of Medicine. He began to practice medicine in Centreville in 1910, and two years later received his appointment as county health officer.

During the two World Wars he served as a neurologist on the three-county (Caroline, Talbot and Queen Anne's) advisory board for the draft. He was on the staff of the Memorial Hospital at Easton and the Kent-Queen Anne's Hospital at Chestertown.

Dr. Fisher was instrumental in the organization of the Queen Anne's County Medical Society, and was a past president of it.

Surviving Dr. Fisher are his wife, the former Jennie May Houser, of Centreville, a son, Dr. William H. Fisher, Jr., who is a surgeon at Peninsula General Hospital, and a daughter, Mrs. David Gilmor; also seven grandchildren.

Vaughen H. Link, M.D.

1913–1959

Dr. Vaughen H. Link, 46, Washington County dermatologist, died July 26. He practiced his specialty in Hagerstown for the past 13 years. He was also associate dermatologist and syphilologist on the staff of the University of Maryland Medical School.

A West Virginian by birth, Dr. Link studied at West Virginia University and the Medical College of Virginia, Richmond, where he received his medical degree in 1939. After completing postgraduate education in dermatology and syphilology at the Skin and Cancer Hospital of the New York Postgraduate Medical School of Columbia University, he received his certificate of specialization in 1946.

Medical society membership included the American Academy of Dermatology, Atlantic Dermatological Association, the Baltimore Dermatological Society, the Washington County Medical Society, and the Eastern Panhandle Medical Society.

Dr. Link is survived by his wife, Louise, and three children, Vaughen Harwood, Jr., James Andrew and Nancy Hellen.

Edward P. Thomas, M.D.

1892–1959

A prominent Frederick surgeon, Dr. Edward P. Thomas, died August 25, at the age of 67.

Dr. Thomas was a native of Buckeystown. He earned his medical degree in 1916 from the University of Maryland.

He served in the Army Medical Corps in World War I. In 1920 he began his practice in Frederick.

Dr. Thomas was a former president of the Medical and Chirurgical Faculty and of the Frederick County Medical Society, and has served on the State Board of Medical Examiners.

Survivors include his wife, Louise, and three children, Edward P. Thomas, Jr.; Baltimore physician, Dr. Robert J. Thomas; and Mrs. Denton Cooley.

Robert S. G. Welch, M.D.

1893–1959

Dr. Robert S. G. Welch, age 66, died August 5. He was a native of Annapolis and practiced as an eye, ear, nose and throat specialist there for 35 years.

He graduated from St. John's College in Annapolis and the University of Maryland Medical School. He was a Navy doctor during World War I.

Dr. Welch was a former president of the Anne Arundel County Medical Society. He was former chief of staff at Anne Arundel General Hospital.

Survivors include his wife, Sarah Bond Welch, a son, Dr. Robert Bond Welch, of Baltimore, and a daughter, Mrs. Sally Welch Geary, of Norfolk, Va.

Samuel R. Wells, M.D.

1904–1959

A heart attack caused the sudden death of Dr. Samuel R. Wells, Washington County medical examiner, on July 21. He was 54 years old.

Dr. Wells was born in West Virginia and attended the University of West Virginia. He completed his medical education at the University of Maryland in 1928; then served as interne and surgical resident at Maryland General Hospital in Baltimore.

In 1930 Dr. Wells opened his practice in Hagerstown, and in 1936 he was appointed deputy county medical examiner. He was on the staff of Washington County Hospital.

A past president of the Washington County Medical Society, Dr. Wells also held membership in the Randolph Winslow Surgical Society of Baltimore and the Maryland Academy of General Practice.

He is survived by his wife, Mrs. Virginia Wells, three children, Samuel, Jr., Richard and Suzanne, his father and brothers and sisters.

Albert L. Wilkinson, M.D.

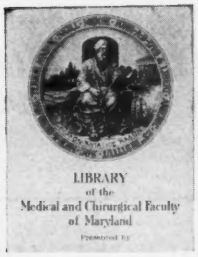
1879–1959

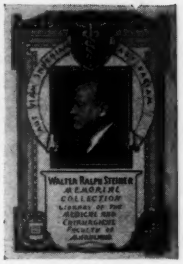
Concluding an illness of six months, Dr. Albert L. Wilkinson died July 28, at the age of 80. He had practiced medicine for 50 years before his retirement several years ago.

Dr. Wilkinson was born in Prince George's County. He studied at St. John's College and Johns Hopkins University, and received his medical degree from the University of Maryland.

While in active practice, Dr. Wilkinson belonged to the Baltimore City and Baltimore County Medical Societies and the Splint Club. He was on the staff of St. Joseph's Hospital.

Mrs. Olivia Burns Wilkinson, his wife, survives.





Library

Louise D. C. King *Librarian*

"Books shall be thy companions; bookcases and shelves, thy pleasure-nooks and gardens." *Ibn Tibbon*

HISTORY OF MEDICINE

Why must we think of history as a record of events of long ago, when actually it is being made as each day succeeds the night? Within the short span of years of those who have lived beyond their prime, not only has history been made, but it is possible to pinpoint much of it. Too often the history of medicine is conceived as a separate entity, whereas in fact, it is but a small, if important part, of history in general. If we feel the history of medicine consists only of the enormous strides made in sanitation, in therapy and in increased knowlege of our body and its function, we omit much that is important.

Among many other changes, let us consider the progress in transportation. No longer does it take months to make available, all over the world, even in remote spots, those things and people necessary to cure and study disease. "From Greenland's icy mountains to India's coral strand" it is possible to obtain the best in skill and knowledge, within hours of time. This in itself, in the memory of most of us, has revolutionized medicine. In fact, the perfection of the airplane has added yet another branch of medicine. It may be closer than we dream possible that there will be organized a group of physicians who practice by airplane only. It is amazing this has not already been promulgated.

Then there is the telephone. The universitality of this instrument has brought enormous economical and social changes which the physician shares. Many a weary journey has been saved and night calls curtailed, even lives saved through this medium; perhaps it has been as much a boon as the automobile.

The trite saying, "You never get anything for nothing," applies here also. All of these, while being factors of great good, bring their own evils in which medicine plays a part. Even the telephone, otherwise unobnoxious, can get on our nerves, though we have not yet seen where psychiatry has made full use of this fact.

Industry, too, has of recent years contributed her share toward the advancement of medicine. You have but to study a book on general surgery to have this fact brought forcibly to your attention.

We have but skimmed the surface and deliberately omitted other branches of science which have contributed in no small degree toward epoch-making advances and changes in the ever broadening science and art of medicine.

What does this all mean to the average man? The main outcome is change, so rapid there is no time for the proper adjustment of the physician or of his patient. Man, being of an impatient nature, rushes headlong into doing something about it, often without giving sufficient thought as to cause and effect. Undoubtedly with increased improvements, there follows increased costs; with the prolonging of life expectancy, there follows a longer old age, and so forth.

It would be an interesting project for a biostatistician to make a chart of cause and effect of all

(*Continued on page 590*)

Maryland
SOCIETY OF PATHOLOGISTS INC.
LOUIS B. THOMAS, M.D., *President*
EDWARD C. McGARRY, M.D., *Secretary*
Suburban Hospital, Bethesda, Md.

THE LABORATORY DIAGNOSIS OF VIRUS DISEASES, A VALUABLE POTENTIAL

The diagnosis of virus diseases is a challenge to clinicians and pathologists alike. The pathologist faces the problem of becoming familiar with the techniques associated with identification and possible isolation of viruses. The clinician must be willing to secure the appropriate specimens from his patients. Present day status of virus techniques permits the practical laboratory diagnosis of virus diseases. Only a few medical centers and special laboratories provide this service.

The principal techniques dealing with the identification of viruses in appropriate specimens from the patient are the use of (1) tissue culture techniques, (2) embryonated hen's eggs, and (3) mice, both adult and suckling.

Tissue culture techniques have facilitated virus identification in the diagnosis of a number of respiratory diseases: mumps, herpangina (Coxsackie A virus), pleurodynia (Coxsackie B), influenza, herpes simplex, measles, vaccinia, pharyngoconjunctival fever (adenoviruses), cytomegalic inclusion (salivary gland virus), croup (croup-associated or CA viruses and others), some cases of the "common cold" (hemadsorption and JV-1 viruses), and some cases of pneumonia (respiratory syncytial viruses and others). Commercial laboratories now provide tissue cultures of several standard cell strains. The cytopathogenic effect is readily detected.

Inoculation of embryonated hen's eggs still is especially useful in the diagnosis of influenza. Mice, adult or suckling, when appropriate, may be used for some viruses,

Library

(*Continued from page 589*)

features in our daily life, newly arisen, demonstrating their impact on medicine, directly or indirectly. Such a study might show us more clearly the direction in which we are heading.

The ever broadening horizon of medicine also affects libraries and their necessity to acquire a more catholic collection. This is particularly true of larger libraries used for research. Strictly medical and surgical texts and journals no longer suffice to supply the demands of our readers. Publications of research carried out by commercial firms are no longer taboo but definitely of value. Chemical, physical, nuclear and other monographs are often indispensable. Labor, with its constant demands, increases the costs of all books and supplies and even librarians' salaries by the consistent rise in the cost of living. From the days of the last generation, when interns and students were urged to publish, has developed an eagerness to get into print far surpassing the value of many of the papers. This increases the labors of the researcher who must separate the wheat from the chaff.

In fact, there is no phase of our economic development that does not have some bearing on medicine. Within this short and superficial article one gets but a peek behind the scenes, but for one well qualified to give us a good look, it might prove profitable as well as fascinating.

It is our fond, but dubious hope, some one may see this little article, catch the bone tossed in the air and worry with it.

especially in cases of suspected psittacosis or Coxsackie virus infection. Serologic methods are used for the precise identification of the viruses. Fluorescent antibody staining is considered one of the serological methods.

The following table indicates procedures currently employed in isolating and identifying viruses.

Clinical Specimens	Blood, Nasal Washing, Sputum, Feces, C.S. Fluid		
Inoculations	Tissue Culture	Embryonated Hen's Eggs	Animals
Reactions	Cytopathogenic effect	Pathologic manifestations and production of complement-fixing antigen	Pathologic manifestations
Viruses to be Identified	Enteroviruses (A) Adenoviruses (B) Myxoviruses (C) Virus causing exanthem (D) Other e.g., JH 2060 (E)	Some arthropod-borne Group A viruses (F)	Lymphocytic choriomeningitis (G) Coxsackie A (H) etc.
Identification Methods			
1. Neutralization	(A)(B)(D)(E)	(F)	(G)(H)
2. Complement-fixation	(B)	(F)	
3. Hemadsorption inhibition	(C)		
4. Hemagglutination-inhibition	(C)		

The clinical diagnosis of a virus disease, independent of the exanthemata of childhood, is frequently made without laboratory confirmation. Specific laboratory diagnostic support would provide (1) an accurate diagnosis, (2) epidemiological information of value to individual communities, and (3) a knowledge of the incidence of disease which should be of value in developing therapeutic compounds and procedures.

In the light of the present day potential for recognizing virus diseases by laboratory procedures, much can be offered the clinician. Both clinicians and pathologists should seek to establish diagnostic viral facilities within existing clinical hospital laboratories.

INTERNATIONAL COLLEGE OF SURGEONS

The Mid-Atlantic meeting of the International College of Surgeons will be held at the Homestead Hotel, Hot Springs, Virginia on November 16, 17 and 18. The profession is cordially invited to attend.

The Heart Page

William R. Scarborough, M.D. – Coeditors – Kyle Y. Swisher, M.D.

A SERVICE OF

THE HEART ASSOCIATION OF MARYLAND

OPEN HEART SURGERY FOR ACQUIRED VALVULAR HEART DISEASE

FRANK C. SPENCER, M.D.*

The technical risk of extracorporeal circulation has decreased to the point where the question often arises whether acquired valvular disease should be treated by a closed operation or by an open one with cardiopulmonary bypass. The main limiting factor, at present, is the inadequacy of the operative procedures used to correct certain types of valvular disease.

Mitral stenosis is best treated in most patients with a closed commissurotomy. An open operation is indicated for "recurrent" mitral stenosis, often a result of inadequate commissurotomy, or for inability to open the valve by digital pressure. We have almost abandoned the use of instruments to cut blindly the commissures, especially the posteromedial commissure, because of the dire complications from an incision a few millimeters in the wrong direction.

The closed treatment of mitral insufficiency, by either the method of a purse-string suture about the annulus or polar cross-plication, has a high mortality rate and uncertain results. The open treatment by plication of the annulus in the commissures is the best method available at present and has been used satisfactorily by several groups. The mortality rate, however, is high, and long term results are not yet available. The valve best suited for repair by plication is one with a dilated annulus but a mobile aortic leaflet that approximates well to the mural leaflet after the annulus is plicated. In some valves the loss of valvular tissue is such that the regurgitation can be repaired only by reconstructing the leaflets with a prosthesis. A reliable prosthesis has not yet been developed. The calcified valve that is stenotic but with considerable regurgitation is virtually inoperable by present techniques. The mortality rate is also high in patients in intractable heart failure with ascites and peripheral edema; if an operation is to be done, it should not be postponed until heart failure has progressed to such an advanced stage.

The conversion of the aortic valve to a bicuspid valve by excision of the non-coronary cusp has attracted much interest in the treatment of aortic insufficiency. Our personal experiences are too limited to warrant conclusions, but the theoretical basis for the operation depends on adequate function of the right and left coronary cusps after the non-coronary cusp is removed. If all three cusps are scarred and retracted from rheumatic valvulitis, repair may not be feasible. A plastic cusp has been successfully inserted at operation in a few patients, and this is almost surely the area of endeavor from which more effective valvular repairs will evolve.

Surgery for calcific aortic stenosis has many risks because of the severe disease of both the valve and the left ventricular muscle. Treatment may be urgent, however, because of the real danger of sudden death when syncope, dizziness, chest pain or left ventricular failure have developed. The best

(*Continued on page 594*)

* Associate professor of surgery, The Johns Hopkins University School of Medicine.

SPECIAL ANNOUNCEMENT

SCIENTIFIC SESSIONS

Heart Association of Maryland

NOVEMBER 19, 1959

9 to 1 P.M.

To be held at:

Chemical Hall

University Hospital

MARYLAND TUBERCULOSIS ASSOCIATION

Christmas Seal Agency for State of Maryland

900 ST. PAUL STREET • BALTIMORE 2, MARYLAND

RESEARCH IN TUBERCULOSIS

WILLIAM S. SPICER, JR., M.D.*

During most of the past century many of the finest scientists in the world have performed research studies aimed at understanding the tubercle bacillus and human tuberculosis. There are literally tons of scientific papers relating to every phase of tuberculosis. In spite of this, we still lack the answers to many important questions in this field. Fortunately, although we still lack knowledge as to the relationship of the tubercle bacillus and human host in the disease process, we have developed highly effective drugs for use in treatment. A brief survey of several of the interesting areas where investigation is proceeding will be briefly covered.

The disappointing factor is that after having advanced treatment to where there is hope of recovery for most cases of tuberculosis, we have now stumbled and seem willing to accept less than the best. The basic tenet of antibiotic therapy for infection is insuring that an adequate amount of the antibiotic reaches the offending organism in the diseased human, either to destroy the organism or slow its growth so the body may destroy the remaining organisms. In addition, it is necessary to be certain that the organism is not resistant to the antibiotic used. In the case of tuberculosis, if such resistance exists, not only will this antibiotic fail, but the tubercle bacillus may become resistant to the second or third antibiotic which is being given in conjunction with the first.

With streptomycin and para-aminosalicylic we know that 1 Gm. a day and 12 Gms. a day of the acid; 15 Gms. a day of the salt, respectively, are necessary to achieve adequate blood levels. However, with our most valuable drug, isoniazid (INH), a greater problem exists. INH is particularly effective because it will kill the tubercle bacillus located in in the body cells. These organisms are protected from the other drugs.

* Director, Section for Pulmonary Diseases, University of Maryland School of Medicine.

The standard dose of INH is 300 mg. a day. It has been shown that 38 per cent of individuals do not obtain adequate blood levels of INH with this dose. By using all three drugs together some degree of compensation for inadequacy in the dosage of one occurs. However, if INH is inadequate intracellular tubercle bacilli will not be destroyed. The solution is to supply laboratory tests to assure that an adequate dose of INH is being given and to determine the sensitivity of the organism to the various antibiotics.

In one group of patients where this procedure has been followed, 99 per cent of the patients converted to negative sputum inside of six months. It should be possible, by examining specimens taken at the time of surgery, to demonstrate that there is, as well, destruction of intracellular organisms. Other studies which show synergism between INH and PAS have recently been reported by the University of Maryland group and are continuing. A full scale study of the effectiveness of individually "tailored" therapy for tuberculosis is needed.

There are other important results to be hoped for with therapy tailored to the individual patient. Studies are underway at the Loch Raven V. A. Hospital, under the supervision of Dr. Richard L. Riley, to determine the method of transmission of the tubercle bacillus from one individual to another. They demonstrate that particles too small to settle out remain suspended and are carried by chance air currents to the lungs of others. These studies have many far reaching implications. Among them is the suggestion that when a patient with positive sputum receives adequate treatment, as defined above, he rapidly becomes non-infectious even though he is still sputum positive. Lest this be misinterpreted, let me emphasize firstly, that this is suggested and not yet proven, and secondly, that adequate treatment is a necessary component. Other investigators are studying the possibilities of im-

munizing against tuberculosis by inoculating attenuated strains of tubercle bacilli via the airborne route.

Work continues in many quarters on the mechanism of immunity to tuberculosis. Circulating antibodies have been demonstrated in tuberculosis, but they do not seem to be related to immunity. Rather, there is a better correlation with hypersensitivity to tuberculin. Immunity in tuberculosis can be more closely correlated to cellular mechanisms. The advent of newer techniques, particularly tissue culture, offers hope that the roles of cells in immunity can be more clearly defined. Investigations conducted 20 or 30 years ago in regard to immunity need to be redone in the light of present knowledge and with the improved tools available.

There is much exciting work being done and asking to be done. Unfortunately, Federal support for work in this field is rapidly drying up. The main voluntary agency in this field contributes less than three per cent of its funds to research. A survey of contemplated and presently going research projects shows that many investigators are turning to nontuberculosis respiratory disease and other fields. Unless some action is taken to provide support for research in tuberculosis we will fall short of the goal of complete conquest and understanding of this disease. We will have settled for less than the best, which seems to be an insidious disease in America today.

The Heart Page

(*Continued from page 592*)

present method of treatment is an open approach with perfusion of both coronary arteries through small cannulae inserted into their ostia after the aorta has been opened. Coronary perfusion seems to have much less risk than induced cardiac arrest. The calcified valve may be opened by splitting the commissures and mobilizing the leaflets by excising the calcium where possible. Some valves are so diseased that the best treatment is probably excision of a valve cusp and replacement with a plastic cusp. This has been successfully done a few times. Current studies with valve prostheses from various plastic materials are encouraging.

FIRST MEDICAL OFFICE ASSISTANTS CLINIC

The Medical and Chirurgical Faculty will conduct its first medical office assistants clinic on Wednesday, October 21 at Faculty headquarters. Invitations have been mailed to office assistants of all member physicians in Maryland, and 300 reservations will be accepted.

Dr. Leo Brady will welcome the gathering. Speakers on the program are as follows:

John Sargeant, Executive Secretary, Medical and Chirurgical Faculty,
"What the Medical and Chirurgical Faculty Does for its Members"

Carol Towner, Director, Department of Special Services, A.M.A.
"Public Relations in the Physician's Office"

Denwood N. Kelly, Assistant Director, Maryland Blue Shield Plan
"Claims Processing at Blue Shield"

Charles Rittler, Manager, Medicare Department
"Medicare and the Doctor's Girl Friday"

Paul H. Geier, Executive Director, Washington Office, Professional Business Management, Inc.
"Collection Hints and Techniques"

Each topic will be followed by a question and answer period.

Coffee and buns, as well as luncheon, will be served.

BALTIMORE CITY HEALTH DEPARTMENT

HUNTINGTON WILLIAMS, M.D.
COMMISSIONER

P. O. Box 1877 Baltimore 3, Md. PLaza 2-2000: Extension 307

Learn To Do Your Part In The Prevention Of Disease

NEW FIGURES ON MENTAL ILLNESS

A first study of the prevalence of mental illness among Baltimore residents by the Baltimore City Health Department has recently been completed by Dr. Matthew Tayback and Mr. Todd M. Frazier of the Research and Planning Section. In this study it has been noted that 10,984 residents of Baltimore City were under treatment for mental illness on May 1, 1959. Of these 8,079 were either inpatients or patients paroled from state mental institutions. The remaining 2,905 were outpatients who were being seen in the various mental health clinics located in Baltimore. There is no evidence of any racial difference in the rate of these mental illnesses, which are widespread throughout the community.

This is the first time such information has become available, and it is a significant addition to our existing knowledge of a major public health problem. These new facts are the result of the combined efforts of the State Department of Mental Hygiene, the Division of Mental Health of the Maryland State Department of Health, and the Baltimore City Health Department and its Research and Planning Section.

Along with the opening of mental health clinics in the Eastern and Western Health Districts in the city, the program of investigation by the Division of Mental Health Research, currently supported by a grant from the Thomas Wilson Fund, and the program of mental health education, this reporting system is an important addition to the Baltimore City Health Department's comprehensive attack on one of our greatest health problems—mental illness.

Huntington Williams, M.D.

Commissioner of Health

CALENDAR OF EVENTS

WEDNESDAY, OCTOBER 14	**CANCER SECTION, B.C.M.S.** 6:30 P.M. National Institutes of Health, Bethesda
SATURDAY, OCTOBER 17	**BALTIMORE CITY MEDICAL SOCIETY TV PROGRAM** 5:00 P.M. WMAR-TV, Channel 2 Dr. Peter Safar, "Anesthesia in Medicine"
SATURDAY, OCTOBER 31	**BALTIMORE CITY MEDICAL SOCIETY TV PROGRAM** 5:00 P.M. WMAR-TV, Channel 2 Dr. W. W. Scott, "The Prostate Gland"
TUESDAY, NOVEMBER 3	**DERMATOLOGY SECTION, B.C.M.S.** 8:00 P.M. 1211 Cathedral Street
FRIDAY, NOVEMBER 6	**BALTIMORE CITY MEDICAL SOCIETY** 8:30 P.M. 1211 Cathedral Street
	OTOLARYNGOLOGICAL SECTION, B.C.M.S. 6:15 P.M. University Club
TUESDAY, NOVEMBER 10	**PEDIATRIC SECTION, B.C.M.S.** 8:30 P.M. 1211 Cathedral Street

Woman's Auxiliary Medical and Chirurgical Faculty

MRS. E. RODERICK SHIPLEY *Auxiliary Editor*

OCTOBER, 1959

ALLEGANY-GARRETT WIVES FORMING AUXILIARY

Doctors' wives of Allegany and Garrett Counties held a luncheon meeting on July 1 at the Cumberland Country Club. The purpose of the meeting was to organize a woman's auxiliary for the two western counties.

Acting as temporary chairman, Mrs. A. J. Mirkin explained the aims and purposes of the auxiliary. Mrs. Carlton Brinsfield was appointed temporary secretary, and Mrs. Leland Ransom and Mrs. Thomas F. Lewis were appointed to seek the approval of the Allegany-Garrett County Medical Society for the formation of such an auxiliary.

Pending approval by the medical society, the following committees were set up:

Nominating committee—Mrs. W. A. VanOrmer and Mrs. James G. Stegmaier

Welcoming and Hospitality committee—Mrs. Samuel Jacobson, Mrs. Wyand Doerner and Mrs. Abdul S. Hashim

Mental Health And Education Program coordinators—Mrs. E. I. Baumgartner and Mrs. Robert Feddis

Bylaws—Mrs. Mirkin.

Another luncheon meeting was planned for September 30, with Mrs. D. Delmas Caples, State Auxiliary president, and Mrs Albert E. Goldstein, parliamentarian for the State Auxiliary, invited to assist with the organization of the new auxiliary.

NEWS NOTE

Mrs. Albert E. Goldstein, of 3503 N. Charles Street, Baltimore has been elected to the board of directors of the National Auxiliary for a term of two years. We are all proud of Elsie.

BALTIMORE CITY MEMBERSHIP LUNCHEON AND SWIMMING PARTY

The Membership Committee of the Woman's Auxiliary to the Baltimore City Medical Society wasted no time after it was appointed. It initiated an early membership drive which has culminated recently with 156 new members in a period of seven weeks. A luncheon and swim party for the new members and workers was made possible by the Membership Committee. This delightful event was held at the home of the Auxiliary president, Mrs. Irving J. Taylor.

After lunch Mrs. Oscar Hartman, a new member of our Auxiliary, generously offered her talents and put on a thoroughly enjoyable water ballet. This was followed by a tantalizing fashion show of beach and summer apparel. The fashions, modeled by members of the Auxiliary, were from the summer collection of the Hecht Company's Northwood store. Models were: Mrs. Herbert Copeland, Mrs. Max English, Mrs. John H. Hebb, Mrs. Theodore Kardash, Mrs. William Magruder. Mrs. Walter Kohn, Mrs. Ross Z. Pierpont, Mrs. Robert Singleton, Mrs. Nathaniel Sharp and Mrs. Richard A. Sindler.

Mrs. Benjamin Highstein secured the largest individual number of new members. Mrs. Walter Kohn was captain of the team that obtained the most members.

Mrs. John H. Hirshfeld, Mrs. Otto C. Brantigan and Mrs. Raymond V. Rangle are on the Membership Committee. If you did not join during the drive, you may do so now. You are welcome at any time as we are still desirous of seeing every doctor's wife a member.

Mrs. Raymond V. Rangle
Membership Committee